NAVAL POSTGRADUATE SCHOOL
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THESIS

AUTOMATED DATA PROCESSING EQUIPMENT FOR THE
FLEET MARINE FORCE (ADPE-FMF)

by

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June 1982

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Automated Data Processing Equipment for the Fleet Marine Force (ADPE-FMF)

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June 1982

ABSTRACT

The West Coast implementation of Automated Data Processing Equipment for the Fleet Marine Force (ADPE-FMF) was completed during calendar year 1981. Designed primarily as a Source Data Automation (SDA) device for the enhancement of Class I input, ADPE-FMF has provided the power of a minicomputer to the battalion/squadron commander. Although the Class I input requirement demands most of the computer's time, there can be much computer time available for the use of the commander should he desire to make that time available. In order to do this, the user must become a master of ADPE-FMF. The purpose of this study is to help the user to become more efficient by providing him with a compilation of pertinent materials from which to draw an operational handbook.

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

A. GENERAL

The West Coast implementation of Automated Data Processing Equipment for the Fleet Marine Force (ADPE-FMF) was completed during calendar year 1981. Designed primarily as a Source Data Automation (SDA) device for the enhancement of Class I[1] input, ADPE-FMF has placed the power of a minicomputer in the hands of the battalion/squadron commander. Although the Class I input requirement demands most of the computer's run time, there can be much computer time available for the use of the commander and his staff. In order to make that computer time available to the unit, local users must become masters of ADPE-FMF.

B. PURPOSE

Undoubtedly, many users will view ADPE-FMF as nothing more than an easier and more accurate version of the same Class I reporting system that previously existed. Those users who would be proficient will make every effort to thoroughly understand the device's purpose and intended operational use. With that understanding as the basis, the aggressive user will

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[1]Different classes of input are defined in the Glossary, Appendix E.

become truly proficient at making the ADPE-FMF fill an increasing number of local needs. This can occur only after the commander's staff and their clerks have mastered Class I input procedures. The purpose of this study is to help the user of ADPE-FMF devices to become more efficient by providing a collection of pertinent materials for the commander and his staff.

C. LITERATURE

Many publications have been written concerning ADPE-FMF. The contractor, International Business Machines (IBM), has provided equipment manuals for all devices as well as systems manuals to describe certain procedures. Functional Managers[2] have published User Manuals to describe specific procedures appropriate to Class IA and IB applications. Headquarters, Marine Corps (HQMC) has published MCO P5230.10 (Implementation and Management Plan) for ADPE-FMF, and is nearing publication of the ADPE-FMF Management Order. Major commands on the West Coast have published similar directives dealing with the implementation and some levels of management of ADPE-FMF devices. The fact is, however, that the battalion/squadron commander, at the lowest level of ADPE-FMF, has received

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[2]A HQMC staff agency whose mission includes the management responsibility for a specific functional area; i.e. manpower, intelligence, operations, logistics, aviation, or fiscal and the responsibility for developing and managing the ADS's which support his area of responsibility.

little attention and guidance from publications issued thus far. This study was written for the battalion/squadron commander and his staff. It includes a compilation of applicable sections of current publications on ADPE-FMF, and is supplemented by other appropriate materials. The figures and appendixes have been designed for ease of removal from the text for reproduction.

D. INITIAL STUDY PROCEDURES

The authors began their study by collecting all available publications, formal and informal, concerning ADPE-FMF. After a thorough study of this material, a visit was made to Marine Corps Base, Camp Pendleton, California, the site of the initial implementation of ADPE-FMF. The authors were briefed by the Information Systems Management Officer (ISMO) of the First Marine Amphibious Force (IMAF), then spent the bulk of their time interviewing individual unit Information Systems Coordinators (ISC). Some of these ISC's were extremely efficient with the ADPE-FMF devices, while others were struggling. Following these ISC interviews, the IMAF ISMO and his ADP personnel were interviewed. Interviews were taped for later review.

E. FOLLOW-ON STUDY

For the following four weeks the authors reviewed the available literature, comparing remarks from the interviews,

and examining problem areas. This was followed by a visit to Camp Pendleton and the Marine Corps Air Station, El Toro, California. During this trip only the division/wing ISMO's and their ISC's were interviewed. The objective of the interviews was to determine whether users felt they had received sufficient training and guidance in ADPE-FMF procedures, and to further identify/analyze problem areas. The bulk of the interview results are included in chapters V and VI, although the interviews have significant impact on the contents of chapters III and IV and on appendixes B and D.

F. COMPILATION OF RESULTS

Every effort was made to disregard comments/problems which were considered to be outside the scope of this study or not appropriate for inclusion herein. For example, problems which have been formally identified to the functional manager would serve no purpose in this study. Only those items which directly affect the battalion/squadron commander have been considered. It is hoped that this manual will provide a single point of reference for the commander, his ISC, and his staff, especially those who lack the necessary background for ADPE-FMF management.

II. BACKGROUND

A. GENERAL

During the late 1960s and 1970s, there were approximately 12 major Marine Corps-wide Automated Information Systems (AIS) implemented. The total impact of this implementation on field units was not immediately known. As these systems continued to develop, however, the scope and intensity of the data input function placed on the unit commander also increased. Data automation became a command problem, for it was perceived by the commander as inflexible in that data automation was tied to large mainframe computers far distant from the operational commander's location. Data automation was also perceived as being administratively intensive in that more and more people were required to support the reporting of data. This entailed the assignment of personnel away from their primary occupational specialties to perform manual data input functions [1]. A third perceived problem of data automation was that it was a highly centralized process revolving around the major AIS's that operated at Automated Service Centers (ASC) and at the Headquarters Marine Corps level. The information needs at those levels were adequately met; however, the information needs at the lowest command level were not met. Automated support in general was not responsive to the reporting unit

level [2]. As such, these units were constantly frustrated by reporting information requirements, yet were unable to obtain any direct benefits in return.

B. CONCEPT DEVELOPMENT AND VALIDATION

Recognizing the problem of personnel support required for data automation functions, Headquarters Marine Corps sponsored a number of studies to identify alternatives to resolve the problems created by data automation in the FMF. The basic recommendation in these studies was to provide data processing support down to the source of input. This is the concept of Source Data Automation (SDA).

1. Data Management Device Requirements Study

The first study of record was the "Data Management Device Requirements Study." The Marine Corps' direction to the contractor, Informatics, Incorporated, was to determine if benefits could be derived from data management devices being employed in FMF units. Additionally, Informatics was tasked to investigate the possibility of providing a commercially available device which was relatively inexpensive. The Data Management Device Requirements Study, completed in 1974, concluded that benefits could be derived from data management devices being employed in the field, and that there was an inexpensive, commercially available capability. The study also identified that approximately 600 to 1300 Marines

were involved in reporting data to the joint manpower and pay system [2].

2. Historical Development and Testing of the SDA Concept

The growth of SDA evolved around the replacement of keypunch functions required for supporting Class I automated information systems and the need to improve accuracy and speed of input for the data submitted.

a. SCANDATA

The earliest version of SDA, SCANDATA, began on the West Coast. This system consisted of a Central Control Unit with terminals attached. It served the purpose of collecting and editing data to be submitted to Class I AIS's [1].

b. Testing

During the period of December 1975 to June 1976, an operational test and evaluation was conducted by selected FMF units. The main objectives of this test were to evaluate the military utility, the operational effectiveness, and the suitability of SDA in garrison and during operational commitments. The test consisted of evaluating two types of equipment.

The first was a stand-alone minicomputer system, such as the SYCOR systems deployed aboard ships with the Mediterranean Landing Force. This system consisted of a Cathode Ray Tube (CRT) and keyboard, cassette, magnetic tape and diskette storage, paper tape punch, and a printer. This

system's operation was discontinued after Headquarters Marine Corps determined that sufficient information had been gathered to evaluate its operational performance.

The second type was a clustered system, such as the ENTREX equipment. This system was used on the East Coast. It consisted of several terminals networked to a host computer. The system provided for the editing and aggregation of data submitted for Class I automated information systems. These tests demonstrated that SDA met the stated objectives.

3. Additional Testing and Concept Validation

a. Independent Evaluation

An independent evaluation of the operational test results was also conducted by the Naval Electronics Laboratory Center (NELC) of San Diego. The primary findings of this evaluation validated the earlier test reports. The NELC SDA Test Evaluation Report dated 10 January, 1977 reiterated that commercial SDA equipment was capable of supporting the major Class I systems as well as local systems, was capable of being operated and programmed by Marine Corps personnel requiring minimal training and no restrictive backgrounds or occupational specialties, and could be transported, powered, and sheltered by standard Marine Corps means in field operations [2]. The formal test was completed in January, 1976. Since that time limited quantities of this equipment have been operational throughout the Marine Corps.

b. Stanford Research Institute Study

Following the test in 1976, another study conducted by Stanford Research Institute (SRI) drew some conclusions regarding SDA in the FMF. Those conclusions were that the FMF units down to the battalion and squadron level had a requirement for an organic SDA capability. Additionally, the use of minicomputer and microcomputer technology was feasible at the lower command echelons. The study also recommended that a capability be provided for Marine Amphibious Units (MAU) and Marine Amphibious Brigades (MAB) [3]. An overview of that study is included as Appendix A. This appendix provides an excellent discussion of the information reporting requirements of the FMF, and will aid the reader in developing a more comprehensive understanding of the purpose of ADPE-FMF.

4. Conclusions

Pursuant to the SRI report, the Marine Corps determined that there was a need for a SDA system down to the Reporting Unit level. This led to the development of a Required Operational Capability (ROC). The ROC identified several objectives for the FMF program. These objectives included reducing the total time involved at the unit level for data entry, reducing data entry errors, and redirecting personnel back to their primary occupational specialties. The ROC also indicated that SDA devices should be made available to all elements of a Marine Air/Ground Task Force

(MAGTF).[3] These devices should be low cost, must not restrict tactical operations, must be easily deployable, should be operated by non-technical personnel, must utilize off-the-shelf, commercially available equipment, and must not rely on any new unplanned telecommunications requirements [4].

5. Economic Analysis for SDA Within the FMF

An economic analysis was conducted and completed in June 1978. It estimated that approximately 570 SDA devices would be required, spread among three levels of support. These levels were the battalion/squadron/logistics support unit level, the Marine Amphibious Unit and Marine Amphibious Brigade staffs level, and the division/wing/logistics service support groups level [2]. The devices were required to support five major functional areas: pay and manpower, supply, maintenance, aviation, and training. The economic analysis corroborated the earlier findings of the Data Management Device Requirements Study by estimating that approximately 1300 Marines could be redirected to their primary jobs.

6. Equipment Acquisition

Actions subject to the concept validation and SDA program development led to the approval by the Assistant Secretary of the Navy (Financial Management) for SDA devices and a Delegation of Procurement Authority document being issued

[3]A MAGTF is a task organized unit varying in size from a reinforced battalion to several divisions with supporting aviation elements.

in October 1978. A contract was awarded to IBM for SDA equipment on 1 March 1980, for the ADPE-FMF program. The contract provided for the delivery of 473 systems with the option to purchase 96 additional systems.

C. ADPE-FMF PROGRAM CONCEPT

1. <u>General</u>

ADPE-FMF is being provided to support small unit (battalion/squadron and separate company) commanders with an organic data processing capability. Primarily acquired to enhance the input process to Class I Systems, such as Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS), Supported Activities Supply System (SASSY), and Marine Integrated Maintenance Management System (MIMMS), ADPE-FMF will be utilized as a source data automation (SDA) tool. Information reporting requirements are discussed in Appendixes A and B.

2. <u>Approved Class I Applications</u>

Fourteen applications have been identified and approved for development in support of Class I Systems. Details of these applications are included as Appendix B. Those major applications are as follows:

Aviation--

Flight Readiness Evaluation Data System (FREDS)
Maintenance and Materiel Management (3-M)

Manpower--

Unit Diary/Commander's Unit Diary Data Base (UD/CUDDB)

Fiscal--

Allotment and Bond Authorization (ABA)
Transcript of Data Extraction System (TODES)
Payment Option Election System (POES)
Disbursing Officer's Voucher (DOV)
Military Pay List (MPL)
Military Pay Voucher (MPV)
Marine Air/Ground Financial Accounting and Reporting System (MAGFARS)

Logistics--

Supported Activities Supply System (SASSY)
Marine Corps Integrated Maintenance Management System (MIMMS)

Operations--

Marine Corps Combat Readiness Evaluation System Software Application (MCCRESSA)

Communications--

Message Editing and Processing System (MEPS)

3. Management Concept

The task of processing information in the Marine Corps has grown and will continue to grow at a rapid rate. The Marine Corps is employing increased automated data processing power to meet this ever growing demand. The current Marine Corps ADP support concept is structured around centralized management, regionally consolidated data processing service facilities, and the continued use of established design and programming activities for the development, operation, and maintenance of AIS's.

a. Centralized Management

The principle of centralized management has been adopted in order to conform to DOD policies. The Commandant

of the Marine Corps (Code CC)[4], as the senior Marine Corps policy official for Automated Data Processing, is responsible for: the procurement of ADPE including hardware, software, and telecommunications; data processing equipment maintenance; the operational control of some facilities; and overall technical direction of Marine Corps-wide data processing functions.

b. Regionally Consolidated Service Facilities

Historically, primary ADP support to the supporting establishments and the FMF has been provided through ASC's and Force Automated Services Centers (FASC's). These centers were designed as functional, nondedicated installations to provide full support, including processing of Class I Systems and general data processing service to users [2]. FASC's were unique in that they were considered to be relocatable (See Appendix A). These activities were being reorganized at the time of this research. Regional Automated Services Centers (RASC's) are being formed from the consolidated assets of regional ASC's and larger FASC's, and will provide nondedicated ADP support to the supporting establishments and FMF commands within their regions. Additionally, the small FASC capabilities will be retained for each MAF as a deployment contingency until a FASC replacement program is complete (FY 84).

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[4]Code CC is the Director, Comand, Control, Communications and Computer (C4) Systems Division, HQMC.

c. Marine Corps Central Design and Programming Activity (MCCDPA)

The three MCCDPA's are located at Quantico, Virginia, at Kansas City, Missouri, and at Albany, Georgia. Each one is organized, staffed, and equipped to analyze, design, develop, program, test, implement, and maintain AIS's as directed by the CMC. Each MCCDPA has organic ADPE, facilities, and personnel capable of accomplishing its assigned mission.

D. ADPE-FMF SUPPORT TO LOCAL COMMANDERS

1. General

In terms of support, ADPE-FMF is dedicated to assisting the commander by facilitating reporting requirements, reducing erroneous inputs to major AIS's, and providing organic data processing support for command functions.

2. Direct Data Entry

The Class I applications listed above provide for direct data capture into major systems by using a combination of "prompting" or "talk through" instructions. These applications provide a step-by-step guide for data input, with an editing feature which enhances format accuracy. This means that certain input will be rejected if it is not in the proper format, requiring the operator to make another input effort. The result is a reduction in time required for Class I input actions and greatly increased accuracy for system acceptance. The information is automatically recorded on a diskette and is ready for delivery to a collection point.

3. Local Options

Commanders who wish to develop local applications (Class IV) should obtain support in accordance with local ADP procedures. Force commanders will publish policy on how programming support is to be provided. Prior to initiating a request for such support, the commander should consult the Class IV programs catalog which is maintained by the Marine Corps Distributed Systems Activity (MCDSA), Quantico, Virginia. The catalog is published and distributed quarterly. Users should review this catalog to determine if an existing Class IV application will fulfill their requirement directly or can be adapted for their specific need. If so, the user must follow local procedures for obtaining a copy of the application and documentation from MCDSA. If a suitable application is not found in the catalog, limited programming assistance should be available through the command Information Systems Management Office (ISMO). Priorities for providing programmer assistance are a command perogative. (See Appendix C for Class IV application development and documentation procedures.) Upon implementation of such applications, copies of the documentation will be forwarded to the MCDSA for inclusion in the quarterly Class IV catalog.

III. SYSTEM DESCRIPTION

A. GENERAL

The ADPE-FMF system devices consist of programmable, commercially available, off-the-shelf data processing equipment which has been suitably ruggedized and packaged to meet Marine Corps requirements. Each device consists of a stand-alone general purpose minicomputer with appropriate software. A general description is provided in this chapter. A more detailed description can be found in equipment manuals and in the contract specifications. A copy of the contract can be obtained from the ISMO for those who desire a deeper look at the system capabilities as they were designed to meet Marine Corps needs. The contract specifications indicate minimum requirements, and in many cases are exceeded by the equipment which has been purchased.

B. HARDWARE DESCRIPTION

Nomenclature:	IBM 4110 (ADPE-FMF)
NSN:	7035-01-099-2949
ID:	08392A
TAM NO:	A0080 VII GP
Stores Act. Code:	3
Category Code:	2

1. Major Components

a. Central Processor Unit (CPU), IBM 4952

The central ADPE-FMF component is a programmable processing unit with memory of 64K bytes (characters). The main memory size is expandable to 128K bytes. Although this expansion capability has not been purchased for all machines, each basic system has sufficient mounting space and necessary power to permit such an expansion. A modem is integral to this component.

b. Video Display and Keyboard, IBM 4978

The video screen is capable of displaying a maximum of 24 lines of 80 characters each on a 9" Cathode Ray Tube (CRT). This component is capable of displaying the 95 character American Standard Code of Information Interchange (ASCII) subset defined in Federal Information Processing Standards (FIPS) Publication 15. Adjacent to the video screen is a keyboard with upper and lower case letters and 30 function keys for data entry, correction, and display [5].

c. Terminal Printer, IBM 4974

The terminal printer is an impact printer capable of utilizing up to four-part standard continuous forms and producing 132 characters per line. The printer operates at a speed of 120 characters per second when printing a ripple test consisting of the full 95-character ASCII subset of FIPS PUB 15.

d. Diskette Storage

Immediate access storage is furnished in the form of two front loading diskette read/write drives. Diskette systems use standard 8" x 8" diskettes with a capacity of one million bytes of storage per diskette. Changing of individual diskettes can be accomplished in less than 20 seconds. This component is an integral part of the display/processor.

e. Modem

The modem is capable of providing asynchronous communications over the spectrum of 75-1200 bits per second (bps). Communications speed in bps is selectable [5]. The modem is integral to the CPU, connected via an RS-232-C interface. The modem possesses a two and four wire line interface, handles ring voltages varying from 90-105V from the Marine Corps MRC-134 radio transmitter set, and supports remote batch communications between SDA devices. See Appendix D for communications procedures.

f. Magnetic Tape Drive (MTD), IBM 4469

The magnetic tape drive is capable of reading and writing 9-track 800 bit per inch (bpi) magnetic tapes in both ASCII and EBCDIC.[5] This component will be provided only for those ADPE-FMF systems which must interface with systems requiring this medium.

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[5]Expanded Binary-Coded-Decimal Interchange Code.

g. Paper Tape Punch (PTP), IBM 4470

A paper tape punch is provided which is capable of punching five-level BAUDOT paper tape at a minimum of 75 bits per second. The resultant paper tape is readable by existing Navy/Marine Corps paper tape readers. This component is held by the MAF ISMO and is provided for those ADPE-FMF systems embarked aboard ship, where the current entry medium to the naval message system is paper tape. The paper tape punch is operable from the CPU through the same RS-232-C port as the modem, but the modem and the paper tape punch will never be required to operate simultaneously. The system provides for manual operation of the punch for such items as punching of leaders and trailers, feeding a new tape supply, and resumption of punching after interruption by the CPU. It is important to note that the ADPE-FMF device does not have the capability to read paper tape.

h. System Power

Each component or integral combination requires only an external source of alternating current (AC) voltage to operate. Conversion from 115 volts AC, 60 Hz sources to 200 volts AC, 50 Hz circuits requires one hour or less, but this must be performed by the contractor. This is therefore an important consideration when transitioning from one operating environment to one which requires a different voltage.

i. External System Cabling

Power cords are approximately three meters in length.

j. Equipment Noise Level

All ADPE-FMF components operate at noise levels compatible with an office environment.

k. Transport Cases

Each ADPE-FMF component or integral combination is packaged in a separate transport case. No packed case weighs more than 130 pounds. The basic system (CPU, printer, video display and keyboard, and diskette drive) fits into two cases and weighs approximately 260 pounds. Transport cases provide protection from water, dust, sunlight, shock, and vibration. Each case contains pictorial packing instructions.

2. Physical Dimensions

Figure 3.1 shows the physical dimensions of ADPE-FMF components. These dimensions are "as packaged," and are useful for embarkation purposes.

C. SYSTEM SOFTWARE

1. General

ADPE-FMF system software consists of a series of required deliverable items which are described in greater detail in the Solicitation Document for the project. This is part of the contract which is available from the ISMO. For specific information consult the appropriate User's Manual.

	4110 DPU	4974 PRINTER	KEYBOARD	4469 MTD	4470 PTP
LENGTH	26"	22.5"	19"	20.25"	18"
WIDTH	19"	13.5"	9"	20.25"	10.5"
HEIGHT	12"	7"	4"	14.5"	6.75"
WEIGHT	90 lbs	130 lbs	12 lbs	85 lbs	35 lbs
VOLUME	3.43 cu.ft.	1.23 cu.ft.	.4 cu.ft.	3.44 cu. ft.	.74 cu.ft.

	4110 TRANSPORT CASE	4974 DUST SEPARATOR	4974 KEYBOARD TRANSPORT CASE	4469 TRANSPORT CASE	4470 TRANSPORT CASE
LENGTH	31"	21"	29"	29"	31"
WIDTH	25"	12"	29"	29"	25"
HEIGHT	17"	4"	17"	19.5"	17"
WEIGHT	31 lbs	10 lbs	38 lbs	34 lbs	30 lbs
VOLUME	7.65 cu.ft.	.58 cu.ft.	8.27 cu.ft.	9.49 cu.ft.	7.62 cu.ft.

Figure 3.1 Physical Dimensions

2. Major Software Features

ADPE-FMF software provides the following capabilities and features:

a. Totally resident operating system.

b. The ability to execute application programs of up to 40K bytes without overlaying.

c. Fully prompted interactive editing of input data.

d. Programmable in low-intermediate level COBOL.

e. Produces local reports from small local files or from input data.

f. Allows rapid inquiry and retrieval from local files.

g. Permits concurrent data entry and report generation.

h. Allows formatting/reformatting input data onto magnetic media.

i. Permits multiple key sorts on data files (or provides extensive file management capabilities).

j. Isolates hardware faults utilizing self-test diagnostic programs.

k. Supports data communications.

l. Includes user "help" features.

m. Provides extensive capabilities relative to data capture.

IV. FUNCTIONAL RELATIONSHIPS

A. GENERAL

Automatic Information Systems (AIS) in the Fleet Marine Force (FMF) and in the supporting establishments provide vital support to the commander in the accomplishment of his mission. Through the use of computers, commanders at all levels utilize resources more efficiently. It is imperative that commanders consider information systems support during planning and during day-to-day operations. Section V, Chapter 2 of Fleet Marine Force Manual (FMFM) 4-1 provides detailed guidance concerning AIS support. Battalion/squadron commanders should ensure that their staff and their ISC's are knowledgeable in that area.

B. FUNCTIONAL MANAGERS

A functional manager is an HQMC staff egency who has the responsibility to manage a specific functional area, such as manpower, operations, aviation, or fiscal. The functional manager is responsible for the development and management of the AIS which supports his area of responsibility throughout the Marine Corps. Functional managers for major ADPE-FMF applications are identified in Appendix B.

C. CLASSES OF AIS

There are four classes of AIS based on the degree of flexibility in operations permitted FMF commanders.

1. Class I System

This AIS is processed on a mainframe computer, serves Marine Corps-wide users, and is under the technical control of a MCCDPA or a contractor.

a. Class IA Application

A Class I derivative which serves the data input function of a parent Class I system. Functional and technical responsibility are the same as a Class I, but it is processed on minicomputers that are assigned to the supporting establishments and the FMF.

b. Class IB Application

A Class I system in all respects except that it is processed locally on supporting establishment and FMF minicomputers.

2. Class II System

This AIS is processed on a mainframe computer but has only local applicability. It is under the functional control of an FMF or supporting establishment sponsor with technical responsibility assigned to a MCCDPA or an Automated Services Center (ASC).

3. Class III System

This AIS is under the control of an HQMC agency and used at the HQMC level only.

4. Class IV System

This AIS is under the functional control of an FMF or the supporting establishment, with technical responsibility assigned to an ISMO. Class IV applications are processed exclusively on local minicomputers for local use.

D. CONTROL OF AIS

Through the use of computers, the commander has experienced a reduction in clerical workload, greater speed and accuracy in information handling, and greater information capability. But, there is also an increased need for technical knowledge, a decrease in command flexibility, and an increase in planning and management requirements to properly control all aspects of the AIS [6]. A well written Standing Operating Procedure (SOP) and a staff thoroughly knowledgeable in AIS matters constitute two major assets for the control of AIS.

E. STAFF RESPONSIBILITIES

Although planning and operation of AIS in the FMF is a responsibility of the commander, many staff officers have specific AIS-related duties [7].

1. Information Systems Management Officer (ISMO)

The ISMO is a special staff officer under the direct control of the chief of staff of a major command. As the single point of contact for command AIS matters, the office of the ISMO is of great importance to the local commander.

The ISMO has control of all ADPE-FMF resources. He provides ADPE-FMF programming support to the battalion/squadron commander, and he coordinates all ADPE-FMF technical AIS training for non-ADP personnel within the command.

2. Information Systems Coordinator (ISC)

Each unit possessing an ADPE-FMF device should designate an ISC to coordinate and manage the command's ADPE-FMF assets.

3. Staff Officers

Each staff officer has responsibility for the AIS planning and operations in his functional area. The commander should formally designate specific AIS responsibilities. This will ensure the efficiency and effectiveness of AIS operations. Staff officers also must prepare SOP's and appropriate contingency plans for the operation of the AIS for their functional area.

4. Communications Officer

The communications officer must advise the commander and his staff on all communications aspects of ADPE-FMF. He must plan and supervise communications support, including contingency plans and operational tests during training. Appendix D is germane.

5. Adjutant and Postal Officer

The adjutant and the postal officer are responsible for internal mail and messenger service and for external mail

services. They must advise the commander, the ISC, and staff officers on the capabilities and limitations of guard mail, couriers, and U. S. Mail for ADPE-FMF support [8].

6. Supply Officer

The supply officer must advise the commander, the ISC, and the staff officers on the special controls and procedures which are applicable to ADPE-FMF equipment, supplies, and budgeting.

7. Shipboard Marine Officers

Aboard the LHA and LCC-class ships are landing force staffs which can provide ADPE-FMF support to embarked units. The shipboard Marine officer advises the commander landing force on the capabilities and limitations of shipboard computer systems, coordinates Marine AIS requirements with the ship's crew, and provides limited instruction to the landing force staff concerning shipboard computers [8].

V. MEASURES OF EFFECTIVENESS

A. GENERAL

The main focus of Automatic Data Processing for the Fleet Marine Force (ADPE-FMF) is to increase operator productivity. Specifically, this higher productivity was to have a significant impact on the accuracy of Class I data input. It was felt that there would be an increase in the Reporting Unit's (RU) acceptance rate, with a decrease in the unit's error rate. This would consequently reduce the throughput time from the RU's initiation of input to the acceptance of that input into the Class I System. There is also an expected reduction in personnel requirements at various locations, but that aspect will not be addressed in this paper.

B. MACHINE CAPABILITIES

The main features of the ADPE-FMF Data Capture Facility (DCF) are intelligent data entry and high-level data entry language with on-line interactive compilation. The DCF checks specified fields for crossfooting and/or batch balancing. If a total is out of balance, the operator rekeys only the incorrect field in each record until brought back into balance. Several special capabilities are provided in ADPE-FMF to support the main features.

Logical and syntactical data checking and editing is performed.
A full function edit language is provided.
Data manipulation, arithmetic and language sequencing is available.
Insertion of precoded data from memory-resident tables is provided for.

Various data checks are available, including:

Check digit.
List of valid or invalid values.
Range of values.
Combination of the above.

C. SOFTWARE FEATURES

To further enhance the accuracy of data input, several software features are provided. These include, but are not limited to, the following:

Fully prompted interactive editing of input data.
Rapid inquiry and retrieval from local files.
Formatting/reformatting of input data onto magnetic media.
Multiple key sorts on data files (providing extensive file management capabilities).
User "HELP" features.
Provisions listed above relating to the DCF.
Isolation of hardware faults utilizing self-test diagnostic programs.

D. ACTUAL RESULTS

The results of the source data automation (SDA) provided by ADPE-FMF can be seen by examining the figures which follow in this chapter. Figure 5.1 shows a major command summary of acceptance rates for the Unit Diary input. The beneficial effects of ADPE-FMF were evident even in its earlier periods. These effects are highlighted more by Figure 5.2.

1980	1stMarDiv	3rdMAW	1stFSSG
Oct	91.7	87.9	88.3
Nov	93.1	88.4	91.7
Dec	94.4	88.9	95.3
1981			
Jan	93.7	90.1	95.1
Feb	92.8	92.3	96.2
Mar	93.6	90.4	97.1
Apr	94.6	94.0	97.9
May	97.6	92.9	98.9
Jun	97.5	95.8	98.5
Jul	98.9	98.9	99.3

Figure 5-1. Major Command Unit Diary Acceptance Rates

	Before ADPE	After ADPE	Acceptance Rate Increase (Percent)	Error Rate Decrease (Percent)
1stMarDiv	93.2	95.8	2.6%	38.2%
3rdMAW	88.6	94.0	5.4%	47.3%
1stFSSG	92.6	97.9	5.3%	72.6%

Figure 5-2. Unit Diary Acceptance Rate Summary

Figure 5.3 reflects the Command Performance Measure (CPM) for the First Marine Division. The CPM is considerably lower than the acceptance rates shown in Figures 5.1 and 5.2. This is due to the fact that the CPM is a combination of the acceptance rate, the timeliness rate, and the correction response rate. The timeliness rate and the correction response rate represent an effort to reflect the time element involved in the diary transactions. All units have five days in which to complete transactions or corrections without affecting their CPM.

The chart in Figure 5.4 is provided to reflect the trend caused by the implementation of ADPE-FMF. The upturns in the line, denoted by an asterisk, indicate the learning curve associated with the introduction of new phases of the application software.

E. FUTURE TRENDS

It is anticipated that the error rates for Class I input will tend toward zero. Once all phases of application software are completed and in the field, and after users have become proficient in the correct procedures, there is no valid reason not to expect acceptance rates of 100%. Anything less should be the exception. Users who are habitually below the 100% level should make an honest evaluation of their efforts. With proper training and supervision, 100% is absolutely achievable for the acceptance rate and for the Command Performance Measure.

1981	1stMarDiv
AUG	94.2
SEP	95.0
OCT	95.2
NOV	*
DEC	95.0

* Data not available due to system software errors.

Figure 5-3. Command Performance Measures (CPM)

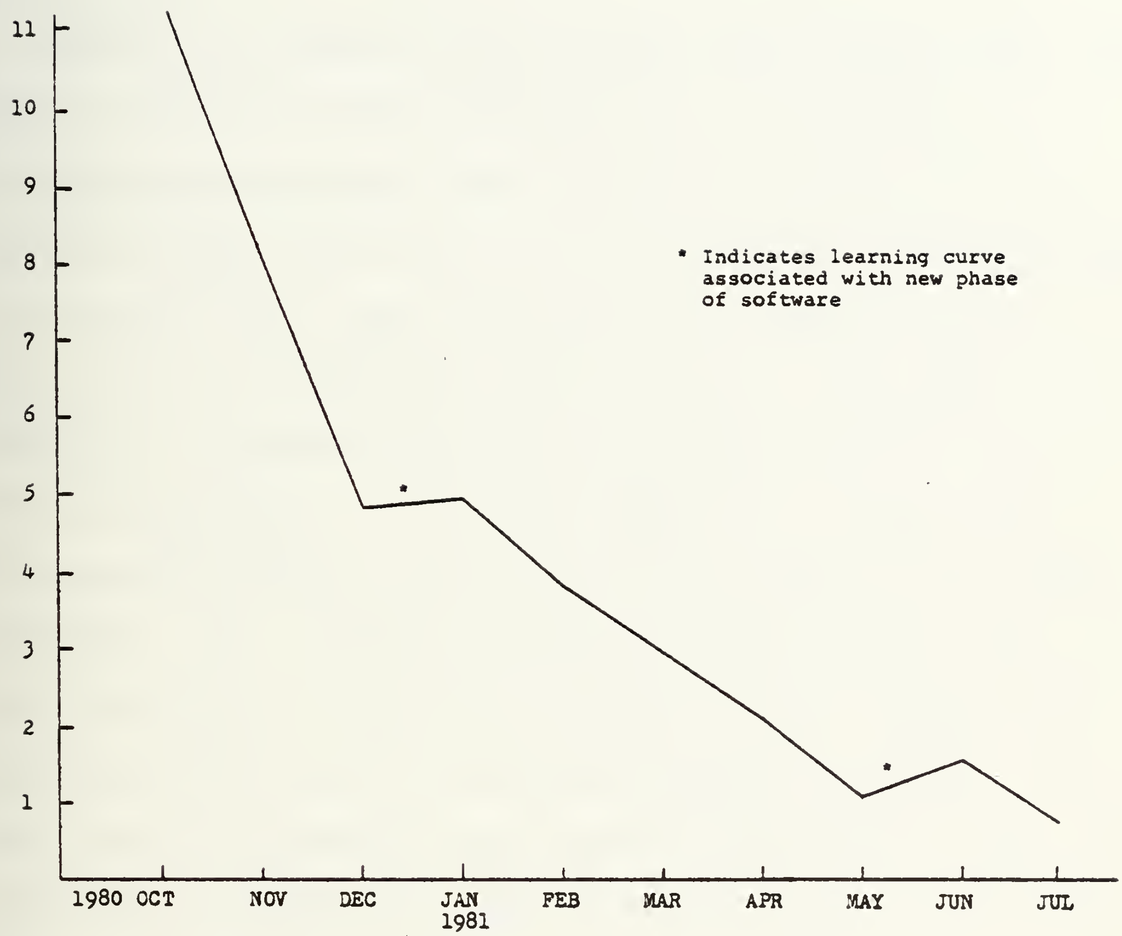

Figure 5.4. 1st FSSG Unit Diary Error Rates

VI. CRITIQUE OF PROBLEMS

A. GENERAL

During the course of this study, many problems were apparent in relation to the implementation of ADPE-FMF as well as its current operational use. Problems presented here are those considered most applicable to the battalion/squadron commander. The authors do not imply that all these problems exist in every unit, nor that commanders will be able to solve their problems using the recommendations of the authors. Rather, these problems are presented to help the commander to become aware of the unique problems associated with the operation of ADPE-FMF equipment. The recommendations are simply stated, but corrective action may be required at HQMC or major command level, beyond the level of the battalion/squadron commander. Further, operational requirements and related tradeoffs may force the commander to accept as being necessary some of the situations described herein as problems.

Basically, all recognizable problems may be summarized as three major problems. All problems identified herein may be viewed as a subset of these three major areas of difficulty:

1. There is a lack of apparent interaction between HQMC functional managers and equipment managers.

2. There is no definitive centralized guidance in the form of Standing Operating Procedures from HQMC and intermediate major level commands.
3. Locally developed or directed functions are resulting in less than optimum usage of the resources causing devices to become print bound.

B. USER INVOLVEMENT

1. Problem

Users feel there is insufficient involvement with the lowest level users on the part of Headquarters Marine Corps, functional managers, and major command ISMO's.

2. Discussion

Users feel there has been a loss of confidence in the ADPE-FMF system because HQMC and functional managers have had little interaction with the end users of the applications. The problems brought on by errors in applications software have eroded the user's confidence rapidly. The general opinion is that the ADPE-FMF system has tremendous potential, but the system deserves closer attention from HQMC and functional managers. Many users feel they can make significant contributions to the system. Many feel that the applications could be made more "user friendly" through closer contact between the users and functional managers. Such interaction will result in a product more valuable and more acceptable to the user. For example, the prompts provided for a unit diary "JOIN"

entry could be in a more logical sequence from the point of view of the user.

3. Recommendation

Functional managers must solicit criticism and recommendations concerning all aspects of the Class I applications currently in use.

C. MACHINE USAGE PRIORITIES

1. Problem

The various methods used by unit ISC's to establish priorities for machine usage are vague and result in inappropriate allocation of machine time.

2. Discussion

Practically all users expressed dissatisfaction with the various means of establishing priorities for machine time among functional areas within the battalion/squadron. However, none of the units visited had an SOP relating to machine usage or location. An SOP, which would include guidance on priority of machine use, would provide the stability which is urgently needed at the user level.

Some units claimed that the priority was set by the area manager with the next scheduled inspection. Others were attempting to record actual usage time for each functional area, and were planning to use that data as the basis for allocation of machine time or the allocation of the devices themselves. The latter method does not consider the fact that

some operators are more proficient on the machine, and it therefore favors those who are the least experienced. The machines will be centered around those who know the least about them.

3. Recommendation

All levels of management should have and require an SOP for ADPE-FMF which addresses priority among functional areas for machine usage as well as the physical location of the machine.

D. NEEDLESS PRINT TIME

1. Problem

Many users increase their print time needlessly through the use of inefficient programming methods.

2. Discussion

As the implementation of Class I systems progressed, users found that Class I requirements tied up the machine beyond normal working hours, thus leaving little or no time for Class IV programs. Besides the fact that there are a number of Class I applications to run daily, a major reason for the large amount of time required is operator inexperience. The more experienced the operator becomes, the faster he can input his data, and the shorter will be his session on the device. Increased training would relieve some of the pressure caused by inexperience.

But the device is also bound by its output. Aside from the proliferation of reports required by Class I and major command directed applications, user functions are also inefficiently using the printer. As a result, the device is becoming print bound. Depending upon the application, some printed outputs are quite lengthy. Within the MIMMS application for a tank battalion, a Daily Processing Report (DPR) can take up to 13 hours to print. Users need to learn output management as well as input management to lessen the effect of this tremendous time sink. In order to have time for Class IV applications, the commander must have operators who are truly proficient with the machine and the applications.

Recurring reports are candidates for consolidation. This consolidation would cut print time, since many requirements could be satisfied with one compile/output effort. Reports and other output having sections which contain only zeroes should be examined for the possibility of printing summary statements rather than multiple zeroes. The ISMO should be consulted since this may require a greater level of programmer expertise than found in the unit.

3. Recommendation

All printed output should be examined in an effort to cut print time.

E. HIGHER ECHELON REQUIREMENTS

1. Problem

Higher echelons are consuming computer time which should belong to the battalion/squadron commander.

2. Discussion

Class I applications take up much of the available machine time. Many users are anxious to do Class IV applications as well, since that is the attractive part of the battalion/squadron commander's computer. The initial definition of ADPE-FMF [2] indicates that the battalion/squadron commander has a management tool at his disposal, following completion of Class I requirements. However, higher echelons are usurping the use of that management tool by directing that certain applications such as Drug and Alcohol, SJA, etc. be run on the device. The result is that ADPE-FMF devices are becoming print bound and the concept of a management tool for the commander is disappearing. If such usage is directed by higher echelons, some effort must be made to ease the burden on the user caused by print time. This could be done in several ways:

a. Higher echelons could do their own printing from diskettes delivered by lower echelons, or from data delivered by networking various machines. This would be a very effective concept and clearly establish an awareness at the directing agency of the print burden caused by a directed application.

Such an acute awareness could eventually lead to drastic reductions in print requirements as agencies more effectively utilize their own assets for data manipulation and management by exception techniques.

b. In cases where a printed report is absolutely vital to the directed function, major command ISMO's could arrange for printing reports from the ASC computers, which are significantly faster than the printing device of the ADPE-FMF.

3. <u>Recommendation</u>

Headquarters Marine Corps and/or major command ISMO's must either redefine or restate the purpose of ADPE-FMF devices or must publish procedures to guarantee the computer time needed at the user level.

F. SUPERVISION

1. <u>Problem</u>

General supervision of the devices and their operators is lacking.

2. <u>Discussion</u>

With the exception of a rough wing order, no directives concerning ADPE-FMF were found below the MAF level. There was no formal allocation of usage time and no encouragement or directive to train operators or to develop Class IV applications. As to the physical set-up of the machines, most ADPE-FMF devices were located in a small cubicle area with little room for

equipment, work in progress, etc. All these point out a lack of proper management at the user level. Operators should be given a comfortable environment in which to work and learn.

3. Recommendation

ISMO inspection checklists should include the above management or supervisory aspects as well as technical aspects of the system.

G. TRAINING RESPONSIBILITY

1. Problem

The entire ADPE-FMF concept is threatened by a lack of training at the user level.

2. Discussion

The majority of the problems observed fall within the realm of training. Personnel, by device or by nature, suffer a great deal at the hands of the machine simply because they have little training to prepare them for using the machine and its Class I applications. Clearly, the largest problem within the realm of training is the understanding as to who is responsible for training the user/operator.

The contract for ADPE-FMF describes the requirements for initial training in support of ADPE-FMF. All initial training is conducted by the contractor, IBM [2]. Those initial implementation teams which visit major commands include functional area representatives to provide information and instruction in specific Class I applications. Marine Corps

Order P5230.10 states that the force commander is responsible for the conduct of all user/operator training [2]. Within IMAF, this responsibility has been further clarified to include the MAF ISMO and the local functional managers [4].

However, ISC's and other ADP personnel interviewed by the authors indicated that the responsibility to train the user/operator rests with the Class I system's functional manager. For example, since the CDPA at Albany, Georgia, developed the Class I SASSY System for use throughout the Marine Corps, that CDPA is also tasked with organizing a mobile instruction team. That team works through the local functional manager, the SASSY Management Unit (SMU), in order to coordinate the scheduling of unit level training. This is a conflict which causes the ISC's to feel little responsibility for training.

The procedures currently being followed on the west coast are appropriate for discussion herein. The ISMO is typically tasked with supplying classrooms, aids, and machines for instruction. Also, one or more programmers may be assigned to learn the system as a unit level operator should know the system, as well as the technical aspects of the program itself. This is done to assist the local functional manager when problems arise that the functional manager cannot resolve. The programmer will then attempt to isolate the problem, correct the problem if it does not involve program changes or else define the problem for resolution at the CDPA level.

ISMO training currently involves three areas: hardware, IBM software, and Class IV applications. Hardware training covers how to operate the 4110 to include keyboard, printer, diskdrives, and standard IPL (Initial Program Load) procedures. This is usally covered in the Self Study course using IBM supplied diskette "SSTUDY" but is often covered in a classroom environment in conjunction with other Class IV training. IBM Software training is included in a basic operators course, periodically given to teach hardware training, basic IBM utility use, and instruction on the IBM supplied "SDAQUERY" software package. SDAQUERY is a series of programs that allows user defined reports to be generated from certain types of databases. The instruction is usually two days in length and the number of students depends upon the number of ADPE-FMF devices which are available for this purpose (devices must be pulled off-line since there are no devices dedicated for training). Self study courses are considered informal, while all others are considered formal. Individual user training is available depending on need and instructor/machine availability. To accomplish Class IV training, the ISMO trains a core of operators for a specific Class IV application in an informal environment and tasks these operators with training their replacements.

3. Recommendation

HQMC and major command ISMO's must clearly define training responsibilities.

H. BATTALION/SQUADRON LEVEL TRAINING

1. Problem

Battalion/squadron commanders have no internal programs to promote user/operator proficiency.

2. Discussion

All of the users interviewed expressed dissatisfaction with training. However, none implemented their own training beyond the scope of calling a knowledgable user at a nearby unit for a quick-fix lesson. Functional managers did provide user training, but the training teams seemed to lack an in-depth knowledge of the systems and, therefore, provided little help to the user. IMAF developed a training plan and implemented user training only to find out later that actual equipment operators were not the same individuals who originally received the training.

It must be made clear to the user that the operator must have two distinctly different types of training in order to become proficient at his job. First, the operator must be trained in the skills of interacting with the machine, the IBM 4110. He must be adept at the keyboard beyond the scope of any specific applications program. Secondly, the operator must be thoroughly familiar with the Class I application he is responsible for. Once he has mastered both, he will be able to discern whether problems that arise are a problem for the ISMO (machine related) or a problem for the functional

manager (application/software related). Then the operator can become familiar with basic troubleshooting and will eventually be able to discover for himself the source of the problem.

All users agreed that they could not take a new Unit Diary clerk, the machine, and the provided manuals, and have that clerk perform the UD Class I inputs without help from some outside source (AA Team/ISMO). If something goes wrong during the course of the input, the operator has neither the desire nor the understanding necessary to figure out the source of the problem. Consequently, he will not troubleshoot, but he will simply call someone else for help. It is at this point where a basic understanding of the system would help the operator decide whether to call the ISMO or the local functional manager, depending on whether the problem could be attributed to the machine or the application. A Users/Operator's Manual (UOM) is supplied with each set of diskettes and is generally sufficient to ensure proper utilization and operation of the Class IV application, but many users have chosen to ignore this potential source of training. Training within the battalion/squadron should ensure that all operators have the basic understanding necessary to operate the system. Training at this level should focus on the use of all manuals provided to support the system. Further, ISC's should ensure that the operators become proficient in the use of terminology unique to the ADPE-FMF applications.

3. Recommendation

Battalion/squadron commanders must publish SOP's which promote internal training by ISC's.

I. SHARING OF KNOWLEDGE

1. Problem

All battalion/squadron level units are progressing at different rates by neglecting to provide for the sharing of knowledge learned by individual units within the same major command.

2. Discussion

During the conduct of interviews, it became apparent that the advantage had gone to those users with experience in the field, or those who had simply worked with ADPE-FMF the longest. Directives from Headquarters Marine Corps to issue the device with the manual and let the users learn it themselves clearly placed the non-computer-oriented user at a disadvantage. The manuals provided were considered too difficult to understand, using terminology that was much too formal for the average Marine to understand. Those who had prior experience or good training could make use of the manuals or interpret them for their own purposes. Without provisions for sharing this knowledge or contributing it to a pool for future use, each unit progressed at a different rate, each stumbling over identical hurdles. Contact teams from the ISMO and from the functional managers were discouraged by the fact that they

had to solve the same problems at many different units, and sometimes at the same unit due to personnel rotation.

3. Recommendation

All ISMO's should conduct frequent conferences for the specific purpose of sharing knowledge among users.

J. CONTROL OF DISKETTES

1. Problem

No effort is being made to monitor and control diskettes.

2. Discussion

No effort is made to monitor the hours of use on a diskette. Users wait for a problem to occur, then try to recover from it. This problem is multiplied by the fact that many users are duplicating and stockpiling diskettes. Some users see the need to make a personal copy of issued diskettes. This causes two major problems. First is the cost of redundant diskettes. Second is the fact that updating/revising old versions is made impossible. Since the ISMO does not know the number and location of old versions, he cannot ensure they are all updated properly. The existence of different versions increases the difficulty in troubleshooting and could result in erroneous input to Class I systems.

Some effort should be made to monitor the hours spent reading/writing on diskettes, especially the crucial ones (i.e. TCUDDB). Due to such factors as head misalignment,

foreign objects on the diskette, fingerprints, smoke particles, and dust, certain diskettes must be duplicated for a backup. These diskettes are usually the ones which contain vital data or which are heavily used. A large percentage of problems with diskettes could have been avoided with proper care. In many cases, it was discovered that the operator had been using the same diskette since the initial implementation of ADPE-FMF.

An example of heavy use involves the unit diary, which writes to two output diskettes, the "TINP03" and the "TCUDDB." Since the program is repeatedly writing to the same physical area on the diskette, that area is likely to fail before the rest of the diskette. When errors first begin, the data/programs should be copied to a new diskette and the old one discarded. However, diskette life could be extended by reallocating the file to a different part of the diskette [9]. The ISMO can provide instructions on how to reallocate a data set.

One way to verify if a diskette is bad or not is to use the "$INITDSK" utility and the "V" option. This will attempt to read all data and will display on the screen the tracks which have errors. Note that the first two tracks will automatically have errors. Ignore this. The IBM supplied System User's Guide will help users learn how to initialize a diskette, allocate space, and how to effectively use the ADPE-FMF system.

ISMO's should consider the possibility of purchasing diskettes for all units. Prior to issuing diskettes, the ISMO should initialize each one. At the same time, the diskette could be coded to help the ISMO maintain control over old versions. This would also prevent stockpiling of diskettes by users.

Finally, users must be discouraged from making unnecessary duplications of diskettes. Periodic review of self service purchases should be conducted by the ISMO in order to identify users who are purchasing more diskettes than normal.

3. Recommendation

ISMO's should consider developing a central system of controlling diskettes.

K. QUALITY OF DISKETTES

1. Problem

Users complain about the poor quality of diskettes purchased from self service stores.

2. Discussion

It is difficult to determine the number of diskette problems actually caused by the user. None of the users interviewed would admit that their operators were mishandling the diskettes.

Diskettes are handled by many different persons daily, and some protection must be afforded. In some cases guard mail drivers have melted diskettes by placing them on the

floor of a vehicle virtually unprotected, except for the guard mail envelope in which it was placed. Further problems arise in the administrative areas where diskettes are kept in drawers, on shelves, in safes, and often just placed where they are convenient to grab. This makes it difficult to protect them, since they are not centrally located. When mailed, diskettes are at the mercy of the postal system, since protective mailers are not stocked at self service stores. A wide variety of diskette mailers and diskette storage containers are on the market but are not currently available at self service centers.

Users must keep records of problems which apply to a particular type or brand of diskette purchased from self service centers. Proper feedback to the center is the only method of correction.

All personnel who handle diskettes must be instructed in proper handling/protection procedures. ISMO's should take action to acquire storage devices and mailers of sufficient quality. Figure 6.1 lists potential sources of diskette mailers. For deployed units, makeshift storage containers can be made. A wooden hand grenade box, lined with plastic, will hold all of a unit's diskettes. Various metal tool boxes from self service have also been used successfully.

3. <u>Recommendation</u>

HQMC and ISMO's should develop a system for quality control of diskettes to include guidance in SOP's, review of

ITEM NUMBER	DESCRIPTION	COST (APPROX)	VENDOR ADDRESS/PHONE
3785-00	Diskette Mailer	$1.00 ea.	Wright Line, Inc.
	Holds 1 to 5.		160 Gold Star Blvd.
	Good markings,		Worcester, MA 01606
	Firm construction.		1-800-225-7348
2604	Diskette Mailer	$2.00 ea.	INMAC
	Holds 1 to 5.		130 S. Wolfe Road
	Excellent markings,		Sunnyvale, CA 94086
	and support.		408-737-7777
A74-673	Diskette Flip File	$42.00 ea.	Highsmith
A74-771	Diskette Tray	$30.00 ea.	P.O. Box 800-A
	Holds 80.		Ft. Atkinson, WI 53538

Figure 6-1. Sources of Supplies

poor quality trends, instruction for protection of diskettes both in transit and at the user level, and conduct active research on methods/devices to improve diskette protection.

L. MANUALS

1. Problem

Manuals supplied by the vendor as well as procedural manuals supplied by the functional manager are not being used by those for whom they are intended.

2. Discussion

The most frequent criticism offered about various manuals was that the manuals are not understandable. All users interviewed agree that the writers of the manuals assumed a basic knowledge of computers. Users claim that this was a false assumption. The self-paced instruction manual for COBOL is considered to be favorable in content, but too general to serve any purpose at the user level. None of the manuals are considered "user friendly." As a result, practically all manuals are kept locked away. When help is needed, the operator simply calls another operator, the local functional manager, or the ISMO. Since this route gets the job done eventually, users see no reason to spend extra time for training operators to understand the manuals involved. Some ISC's have attempted to simplify procedures by reworking certain parts of the manuals. Figure 6.2 is a page selected from the User/Operator Manual for the Unit Diary application, typical of the language

NARRATIVE: THIS PROGRAM IS INVOKED MANUALLY USING OPERATOR COMMAND $L REFORMAT THE CUDDB IAM FILE FROM THE UPDATED CUDDB BACKUP FILE. THIS PROGRAM USES THE VIRTUAL TERMINAL FACILITY TO INVOKE $IAMUT1 AND $DISKUT1 TO REORGANIZE THE CUDDB IAM FILE.

THE FOLLOWING DIALOGUE IS THE COMMUNICATION BETWEEN THE APPLICATION PROGRAM T7040P71 AND THE UTILITY PROGRAMS IT INVOKES.

	UTILITY	COMMAND	RESPONSE
01	$IAMUT1	SET	SE
02	$IAMUT1	BASE RECORDS	2500
03	$IAMUT1	BLOCK SIZE	512
04	$IAMUT1	RECORD SIZE	240
05	$IAMUT1	KEY LENGTH	10
06	$IAMUT1	KEY POSITION	1
07	$IAMUT1	FREE RECORDS	0
08	$IAMUT1	FREE BLOCKS	10
09	$IAMUT1	RESERVE BLOCKS	10
10	$IAMUT1	RESERVE INDEX	10
11	$IAMUT1	FREE POOL	10
12	$IAMUT1	DELETE HEADER	0
13	$IAMUT1	LOAD $DISKUT1	CR
14	$DISKUT1	CHANGE VOLUME	CV TCUDDB
15	$DISKUT1	DELETE DATA SET	DE T7040X07
16	$DISKUT1	DELETE ?	Y
17	$DISKUT1	ALLOCATE DATA SET	AL T7040X07 3074 D
18	$DISKUT1	END $DISKUT1	EN
19	$IAMUT1	OBTAIN MESSAGES	ECHO
20	$IAMUT1	ECHO ?	Y
21	$IAMUT1	DEFINE FILE	DF
22	$IAMUT1	IMMEDIATE WRITE-BACK	N
23	$IAMUT1	FILE NAME	T7040X07,TCUDDB
24	$IAMUT1	END $IAMUT1	EN

Figure 6.2. Sample Page From User/Operator Manual

used in such manuals. Users consider this to be quite confusing. Figure 6.3 is an actual example taken from an instructional manual written by a user. Supervisors in the field say this is the language that is necessary.

Operators who are allowed to struggle with the system, getting information from other sources by phone, only lengthen the time required to complete a task. This also greatly increases the number of man-hours consumed, since operators call upon higher levels for solutions to problems caused by ignorance and which could be solved by the user by examining the manuals. Manuals which have been stored in lockers should be placed in the hands of the operator so that operators can master the ADPE-FMF system. ISMO/ISC's must devise methods to instruct and evaluate operators' proficiency with the procedures in the user manuals. This will result in more proficient operators who can do a multitude of tasks on the device.

3. Recommendation

Commanders should require their operators to become thoroughly familiar with the unique style of terminology used in the available manuals.

TO USE THE SDAQUERY DISKETTE

Step 1. Place the IRRPG2 Diskette in Drive 1
Step 2: Close Drive 1
Step 3; Place the TRECON Diskette in Drive 2
Step 4: Close Drive 2
Step 5: Turn the computer on
Step 6: Press the ATTENTION Key
Step 7: Type in $L $DISKUT1
Step 8: Press the ENTER Key
Step 9: When the computer prompts you for "COMMAND(?):" type in CV TRECON
Step 10: Press the ENTER key
Step 11: When the computer prompts you for "COMMAND(?):" type in LA
Step 12: Press the ENTER Key
Step 13: When the computer prompts you for "COMMAND(?):" type in RE
Step 14: Press the ENTER Key
Step 15: When the computer prompts you for "MEMBER NAME:" type in T7Ø4ØFØ9
Step 16: Press the ENTER Key
Step 17: When the computer prompts you fr "NEW NAME:" type in MMSDB
Step 18: Press the ENTER Key
Step 19: When the computer prompts you for "COMMAND(?):" type in EN
Step 20: Press the ENTER Key
Step 21: Press the Blue Load Button
Step 22: Press the ATTENTION Key
Step 23: Type in $T
Step 24: Press the ENTER Key
Step 25: Type in the correct date and time
Step 26: Press the ENTER Key
Step 27: Press the ATTENTION Key
Step 28: Press the appropriate PF Key for the roster desired
Step 29: Upon completion of the roster press the Blue Load Button
Step 30: Press the ATTENTION Key
Step 31: Type in $L $DISKUT1
Step 32: Press the ENTER Key
Step 33: When the computer prompts you for "COMMAND(?):" type in CV TRECON
Step 34: Press the ENTER Key
Step 35: When the computer prompts you for "COMMAND(?):" type in LA
Step 36: Press the ENTER Key
Step 37: When the computer prompts you for "COMMAND(?):" type in RE
Step 38: Press the ENTER Key
Step 39: When the computer prompts you for "MEMBER NAME:" type in MMSDB
Step 40: Press the ENTER Key
Step 41: When the computer prompts you for "NEW NAME:" type in T7Ø4ØFØ9
Step 42: Press the ENTER Key
Step 43: When the computer prompts you for "COMMAND(?):" type in EN

Figure 6.3. Sample Rewrite of Operator Procedures

APPENDIX A

STANFORD RESEARCH INSTITUTE STUDY OVERVIEW

A. BACKGROUND

1. General

Stanford Research Institute (SRI) began its study at a time when the Marine Corps' ADPS was being provided under the Force Information System (FIS) concept. Under this concept, each Marine Amphibious Force (MAF) was provided with one large-sized and one medium-sized Force Automated Services Center (FASC).[6] Each larger FASC used an IBM 360 Model 65 large-scale, general-purpose, third generation computer. Each small FASC used an IBM 360 Model 50 medium-scale computer. Fleet Marine Force Pacific (FMFPAC) Headquarters had its own IBM 360 Model 50, while Fleet Marine Force Atlantic (FMFLANT) Headquarters had an IBM 360 Model 30.

2. Services

Centralized data processing services and centralized data bases were provided to division, wing, and Force Troops from these centers. Each FASC was situated in an area having a major concentration of FMF activities and served users in its particular geographic area. Further, each Marine Aircraft

[6]The larger FASC was called FASC-medium, while the smaller was called FASC-small.

Group (MAG) within each Wing had an organic data processing capability provided by an AN/UYK-5 (Univac 1500) computer. This was dedicated to support of Navy aviation logistics systems.

3. Shipboard Computers

Aboard LCC and LHA class ships, the Commander Landing Force (CLF) staff had access to a computer system on which they could exercise the ASIS shipboard command system. Aboard the LCC's, the computer system was the second generation Univac CP-642B; aboard the LHA's, the computer system was the third generation Univac AN/UYK-7. These computers, however, were under Navy control on the ships.

4. Deployed FASC's

Each FASC was considered to be deployable. It was housed in a movable shelter and provided with movable sources of air conditioning and electrical power. Deployment occurred only with a MAF, however, and required a period of from 30 to 60 days, unlike the MAG computers which were housed in large vans and were somewhat more readily deployable.

5. CDPA Concept

Major computer programming and ADS design activities for the FMF were performed under the Central Design and Programming Activity (CDPA) concept. CDPA's were located at supporting establishments installations. Individual CDPA's were assigned responsibilities for development efforts and

computer programming activity for specific functional areas such as manpower, logistics, and aviation.

6. Programming

Computer programming for FMF applications was done largely in COBOL while others used assembly language programming, especially large supporting establishment ADS to which the FMF supplied data as part of its reporting requirement. The Mark IV file management and information retrieval system, accessible through its own command and inquiry language, was in widespread use at the FASC's. A variety of general utility programs and packages was also available.

B. PROBLEMS AND NEEDS IDENTIFIED

1. Reporting Requirements

One major and growing problem connected with information processing in the FMF was the heavy burden of upward data reporting which falls upon FMF units and personnel. This data reporting, much of it for Class I systems required for overall Marine Corps and supporting establishments management activities, absorbed significant resources of FMF operating personnel, including combat personnel.

2. Errors

Another problem was the high level of data error rejection and correction activity that was being experienced by the FMF. The need for reducing this, and the benefits of doing so, were apparent.

3. Flexibility

There was an acute need to provide commanders and staffs of units below the division/wing/FSSG (Force Service Support Group) level with more flexible and responsive ADP services.

4. Timeliness

The problems of lengthy processing cycles and long turnaround times for Class I outputs intended to serve the needs of FMF units forced many FMF activities to rely on internal manual and ad hoc methods of providing necessary operating information.

5. Deployment of the FASC

The comparative unsuitability of the FASC installations to be deployed with the MAGTF's into an amphibious objective area was perceived as a major problem. Deployment could be supported only in the case of MAF-sized forces, and only then for operations exceeding 30 to 60 days. FASC support of deployed MAB's and MAU's was impossible.

6. FIS Concept

The overall philosophy and architecture of the FIS concept was not well suited to supporting teleprocessing and remote access to services, especially during deployments.

7. Other Influences

Impending obsolescence of the IBM 360 computers and the programmed replacement of these in the early 1980's time

frame demanded that action be taken to avoid major duplications of effort. Any delay in the replacement of the aging computers would penalize the FMF in terms of decreased machine reliability, unavailability of vendor hardware and software support, and shortage of experienced data processing personnel.

C. INFORMATION PROCESSING REQUIREMENTS

1. Definition

Information processing requirements refer to those activities that are necessary for the systematic collection, manipulation, and dissemination of data useful in the management of FMF resources by units within the FMF, and by elements of the supporting establishment.

2. Objective

The objective of SRI's study was to identify the information processing requirements that should be considered in developing an ADPS for the command and management needs of the FMF during the 1980's.

3. Scope

SRI's compilation of requirements was meant to serve the specific purpose of providing a supporting base for proposing and evaluating ADPS alternatives. SRI addressed only those tasks that appeared amenable to data processing support and that would benefit from such support if it were available. The focus was on the requirements observed in the present as well as those requirements which could be expected to exist in the FMF in the 1980's.

4. Philosophy

SRI's philosophy was one of identifying opportunities for increased performance, decreased resource usage, extended capability, and better responsiveness of information processing in the FMF. No attempt was made to cost-justify the automation of tasks.

5. Approach

SRI's approach to the formulation of alternative ADPS concepts was multi-faceted. Those facets formed the core structure that SRI used in the tabulation of FMF echelon-level information processing tasks.

a. Environmental Factors

SRI reasoned that any future FMF ADPS must be suited to supporting units of the FMF in any of the operating situations in which the FMF's stated mission could place them. This meant that requirements must be stated for peace-time administrative activities, as well as deployed combat activities. To this end, SRI focused on three FMF operating environments: the garrison environment, the deployed afloat environment, and the combat ashore environment.

b. Organizational Framework

SRI separately considered the three major classes of FMF elements: the ground element, the air element, and the combat service support element. In conjunction with these classes SRI associated three echelon levels: the division/wing/FSSG level, the regiment/aircraft group/LSG (Landing Support

Group) level, and the battalion/squadron/LSU (Landing Support Unit) level. Echelons lower than the latter were determined not to be well suited to the support of organic ADP equipment.

c. Management Requirements Structure

SRI expressed the requirements through six generalized management functions. These functions are:

(1) Planning. Devising a detailed method, formulated beforehand, to accomplish a specific goal.

(2) Programming. Allocating resources to specific uses and assigning personnel to particular tasks in support of a plan.

(3) Evaluating. Assessing other activities in relation to preconceived criteria of a plan.

(4) Monitoring/Inventorying. Keeping track of and updating information describing personnel, material assets, and events.

(5) Forecasting. Identifying in advance alternative options and predicting their likely consequences.

(6) Supervising/Controlling. Making all decisions and actions necessary to implement a plan or to meet any organizational or operational objective.

d. ADP Functional Requirements

SRI associated with each echelon-level activity the primary ADP functions it required in order to express the requirements in terms that made visible the generic capabilities of ADPS. The ADP functions used were:

(1) Source Data Entry. The initial recording of data to be processed by a data processing system; and/or the actual entry of data into a data processing system for processing.

(2) Processing. The processing of data within a data processing system; such processing falls into the following broad categories:

(a) Data Correction/Validation--the performance of checks on the correctiveness of entered data.

(b) Test Handling--the performance of editing and manipulating operations on textual material.

(c) Mathematical Calculations--the performance of arithmetic/numerical operations on data.

(d) Information Storage/Retrieval--organizing, storing, selecting, and extracting information; rearranging the order of data and information.

(e) File Management--the building and maintenance of data bases.

(3) File Storage. The holding of data or information in files.

(4) Data Transmission. The outbound transmission of data to a different data processing facility or to a remotely located user location.

(5) Information Output/Display. The output of information from a data processing system for end use by humans.

6. Observations

a. General

A major impetus for this study was a general recognition that the current FMF ADPS capability would not adequately support FMF information system requirements in the 1980's. It was evident that the incorporation of advanced ADP technology and procedures offered opportunities for efficient and effective enhancement of FMF command and management information system capability.

b. Benefits

It was also evident that an ADPS must support two major classes of activity at each echelon level; the reporting activity of FMF units to higher commands, and the management of local unit information and management applications. Automated support of these two classes of activity down to the battalion/squadron/LSG echelon promised the following benefits which would inherently improve readiness and extend the quality of command and management capabilities for planning, monitoring, and decision making at all levels:

(1) Reduction in the FMF man-hours currently expended to input Class I information for reporting purposes.

(2) Near abolishment of redundant manual handling and transcribing of Class I information, with an attendant increase in the accuracy and acceptability of entered data.

(3) Improved capability and responsiveness for selective retrieval of pertinent information from a large reservoir of stored information.

(4) Availability of powerful logical and mathematical tools for more effective evaluation of the status of FMF resources.

7. Current System Deficiencies

The methods by which Class I reporting was accomplished exhibited characteristics of technical obsolescence, and the accomodations that the FMF organization routinely makes to circumvent the lack of technical capability severely distorted the fundamental makeup of the information system. The combination of manual and automated processes was markedly deficient and unwieldy. The shortcomings presented themselves in the following manner:

a. Updates of master data bases, because of the unacceptability of lower echelon data records and the length of time required to institute error correction procedures, required weeks or even months.

b. Component data bases within a single Class I ADS were difficult to synchronize.

c. Significant numbers of man-hours were involved in redundant transcription of data from paper to computer cards to magnetic media.

d. Data entry was marked by a lack of verification and validation of format and context at the entry source.

e. File management and data base integration capabilities fall well short of capabilities offered in today's ADP market.

f. Information retrieval was cumbersome and unresponsive.

g. The Class I reporting processes failed to complement the local unit management needs.

8. Requirement for SDA

The requirement to streamline and automate the reporting process translated in ADP terms to a requirement for source data entry, wherein data is captured close to its source and manually recorded only one time on machine-readable data media. Further, in order to match the operational realities of the FMF information system, it is necessary that the source data entry capability include user data entry assistance in the form of prompts, editing, and validation checks.

9. Local Unit Needs

SRI found that a significant number of local unit activities lend themselves to automation. These include management procedures involving those activities listed under C.5 above. All of these were being performed by FMF personnel using primarily manual methods, paper data bases contained in file cabinets and acetate status boards. The requirement to automate such manual processes supporting local unit management indicated a requirement for responsive user access to the following functional capabilities:

a. Automated data capture and input.

b. Data storage, manipulation, and retrieval.

c. Report generation.

d. Query and response mode operation.

e. Analysis capability.

10. Continuity of ADP Service

One important concern is the continuity of ADP service during the transition of a MAGTF from one operating environment to another. It was apparent from SRI's study of operational and information processing requirements that:

a. There is a requirement both afloat and ashore for a complete data processing functional capability for all MAGTF's.

b. External reporting requirements are less affected by interruptions in data processing support because the time criticality of information is not so stringent as it is in the local support applications.

c. Effectiveness of local information processing is determined by its capability to provide uninterrupted service, in a timely manner, in both the afloat and ashore environments, as well as during the transition between the two.

d. The most critical functional data processing capability in assuring transitional capability between the environments lies in the information storage/retrieval and output/display capabilities.

11. Data Base Composition

SRI investigated the composition of the data bases which would reside at lower echelons. These conclusions were drawn.

a. A substantial portion of a local unit data base can be assembled from the information already captured and reported to Class I ADS.

b. There exists a significant body of information at each unit that is pertinent to that unit alone.

c. Within each functional area, the content of the Class I ADS information most valuable to a particular unit depends to a great extent on the echelon where that unit resides.

D. SUMMARY

1. General

SRI concluded that their study indicated a strong rationale for the selection of one of their recommended ADPS concepts as the 1980-1990 replacement of the Marine Corps' then current system. Their study of the FMF requirements for future information processing supported the view that an expanded, automated information capability for the 1980's existed.

2. Feasibility

A survey of currently available ADP hardware and software clearly indicated that the prerequisites for automated support of such information processing requirements in the FMF

could be met. The trends in both hardware and software development indicated a movement toward meeting the reliability, mobility, ruggedness, ease of use, and size requirements. The objective of satisfying the FMF ADP requirements with anticipated constraints on manpower, both in number and skill level, appeared achievable. Then current trends in hardware and software resulted in systems which were easier to maintain, operate, and program. Of even greater significance was the trend toward a decreased ADP-oriented personnel requirement which results from the much more efficient involvement of the user himself in the satisfaction of his day-to-day information needs and applications.

3. Costs

SRI concluded that the cost of such an expanded capability was not prohibitive. Hardware costs and dedicated ADP personnel costs were declining. The requisite skill levels for operators and maintenance personnel involved in the daily operations of computing resources was being lowered by new technology.

4. Security

There were no apparent major obstacles to the satisfaction of requirements for physical security, security of information, integrity of the system or the information contained therein, guarantees of privacy of personnel data, or in meeting electromagnetic emanation (TEMPEST) requirements.

5. Specific Conclusions

SRI's analyses indicated clearly that FMF units down to the battalion/squadron level had a requirement and a desire for automated support of their information processing activities. It was evident that the FMF required a flexible, modular ADPS to provide support for garrison, afloat, and combat ashore activities, as well as for operations of different magnitudes, complexities, and intensities.

Operationally, the system must provide a capability for rapid deployment of ADPE that units have used and gained experience with in garrison. The significant benefits that SRI's recommended concepts offer in addition to better coverage of FMF environments and individual units are:

a. Improvement of the Marine Corps Class I ADS reporting process through source data entry capability and telecommunications capability that will:

(1) Provide one-time entry of data on machine-readable media.

(2) Provide data editing and validation checks close to the source of data entry.

(3) Speed the process of information reporting from the battalion/squadron level and up.

b. Augmentation of the resource management capability at each echelon from the battalion/squadron up by means of the following automated functional tools:

(1) Interactive inquiry/retrieval of information from local data bases.

(2) File management capabilities.

(3) Report generation capabilities.

(4) Text handling.

(5) Logical and mathematical algorithms.

APPENDIX B

CLASS IA AND IB APPLICATIONS

The following paragraphs provide a general description of approved Classes IA and IB applications programs. Included in each will be information concerning the objective, sponsor, design and programming activity responsible for it, who the users are, an overview description of the application, and a summary of how information travels from the user to the Class I system it serves.

A. FLIGHT READINESS EVALUATION DATA SYSTEM (FREDS)

Objective. To standardize the collection and reporting of Marine Corps aviation flight data.

Sponsor. HQMC, DC/S for Aviation, (CMC (Code ASA)).

Designer/Programmer. MCCDPA, Quantico, VA.

Users. All Marine Corps aviation units, aviators and aircraft operators. The system is designed for daily processing.

Description. FREDS is a management information system for aviation. It collects, analyzes and evaluates aviation flight data for use in decision making.

FREDS combines the inputs of the Individual Flight Activity Reporting System (IFARS) and the Aircraft Statistical Data (ASD) for the Maintenance Data Collection System (MDCS) into a single source record. This data is validated daily by local

data processing means and forms the basis for a series of computerized reports. These reports, such as the Monthly Individual Flight Activity Report (MIFAR) and the Monthly Aircraft Utilization Report(MAUR), are generated on a once monthly schedule. With the application of ADPE-FMF, users may store FREDS data at the local level for use in local applications. This gives the commander a timely information generating capability for use in decision making.

Data Flow

Garrison. The FREDS data flow begins with the designated user. A FREDS form is completed at the termination of an aircraft flight or cancellation. This data is then transferred to a floppy diskette by use of the ADPE-FMF device. The floppy diskette then moves to the nearest data processing point available for data aggregation and processing, which may be a FASC or a Remote Job Entry (RJE)[7] site, depending on the user's geographical distance from such facilities. After the FREDS data has been processed, various feedback reports are provided for management information. At the local level, through the FREDS application on the ADPE-FMF terminal, the user has the capability to generate real time FREDS data.

Deployed. The FREDS data flow when deployed is the same as in garrison with the exception of timely delivery to the data aggregation and data processing sites. The floppy

[7]RJE is discussed in Appendix D.

diskettes must be delivered to the data processing site (RASC) by the most expeditious means from the deployed area. In some geographical areas, there will be the capability for data input by the unit by means of a RJE terminal.

B. AVIATION MAINTENANCE MATERIEL MANAGEMENT (AVIATION 3-M)

Objective. 3-M is the management information system used to assist in achieving and maintaining Chief of Naval Operations (CNO) directed materiel condition standards through management of personnel, money, and materiel.

Sponsor. HQMC, DC/S for Aviation, (CMC (Code ASA)).

Designer/Programmer. Marine Corps Distributed Systems Activity (MCDSA), MCDEC, Quantico, VA. (Code D-15).

Users. All Marine Aircraft units. The system is designated for daily processing.

Description. The Maintenance Data Collection System (MDS) is an integral part of the maintenance and materiel management system and is designed to accomplish the mechanized collection and processing of statistical data essential to the efficient management of resources. This information is collected at the Organizational Maintenance Activity (OMA) and the Intermediate Maintenance Activity (IMA). The data falls into the categories of equipment, personnel, and materiel. With the application of ADPE-FMF, users may store data at the local level and have real time management information for decision making purposes.

Data Flow

Garrison. 3-M data is transferred to a floppy diskette by use of the ADPE-FMF device at the unit level. The floppy diskette then moves to the nearest data processing facility available for data aggregation and processing. This facility may be a RASC or an RJE site, depending on the user's geographical distance from such facilities. After the 3-M data has been processed, various feedback reports are provided for management information. At the local level, the user retains a 3-M data file. This immediate access to 3-M data information will enhance a user's ability to monitor personnel assignments and utilization, maintenance schedules, and equipment capability.

Deployed. The data flow is the same as in garrison. However, shipboard users will utilize the Navy Data Services Facility (DSF) instead of the RASC. In some geographical locations, a RJE site will also be used for data input.

C. UNIT DIARY AND COMMANDER'S UNIT DIARY DATA BASE (UD & CUDDB)

Objective. To increase the operational effectiveness of FMF reporting units in submitting unit diaries.

Sponsor. HQMC, DC/S for Manpower, (CMC (Code MPI)), Local Functional Manager: A C/S, G-1 and ACU.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All active FMF unit diary reporting units. Usage frequency is daily for most units.

Description. The application will provide basic edits to JUMPS/MMS data input. It will simultaneously create a magnetic and paper unit diary. In addition, the application will build and update a Commander's Unit Diary Data Base (CUDDB) for local manpower retrieval use. Monthly, the CUDDB will be reconciled against the JUMPS/MMS Field Master File at the supporting Automated Services Center (ASC).[8]

Data Flow

Reporting Unit (RU). Initial unit diary input will be accomplished by the reporting unit via the ADPE-FMF device. The ADPE-FMF device, with its printer, will create a floppy diskette, print the UD data on paper in the proper format and update the CUDDB. After the commander signs a printed copy of the UD, the reporting unit will deliver the floppy diskette and the paper original UD to the responsible Administrative Control Unit (ACU) according to local procedures. In addition, the RU will forward two copies of the UD to the local disbursing officer.

Administrative Control Unit (ACU). ACU's will receive both the floppy diskettes and original signed unit diaries. For units at RJE sites, the ACU will receive a tape of aggregated unit diaries from that site via the ASC that received the RJE transmission. A listing of the tape will be run for

[8]At the time of this study, the functional manager was in the process of correcting difficulties with this reconciliation process.

the ACU to maintain quality control. Unit diaries will be logged in a control log and checked for format errors, consecutive UD numbers, etc. Original signed UD's will be retained by the ACU. The diskettes will be delivered to the ASC for further processing and transmission to Kansas City, Missouri.

Automated Services Center (ASC). Designated ASC will receipt for diskettes which will be used for processing into the next JUMPS/MMS cycle. RJE sites will receipt for UD diskettes to be aggregated and transmitted to the ASC on a daily basis.

Deployed Units. Unit diaries will be created by the reporting unit on the ADPE-FMF device. Aboard ship the unit diary may be mailed, couriered, or transmitted via naval message. Ashore, if the unit diary is received as a naval message it will be entered onto a diskette by the ACU or by the shore unit, according to local procedures, and the diskette will be submitted to the ASC. Reconciliation of the CUDDB with the Field Master File will be accomplished by the deployed unit upon receipt of the reconciliation diskette sent by mail or courier from the ASC.[9] All output documents for the deployed unit will be picked up from the ASC by ACU personnel.

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[9]At the time of this study, the functional manager was in the process of correcting difficulties with this reconciliation process.

D. ALLOTMENT AND BOND AUTHORIZATION (ABA)

Objective. To enhance preparation and input of ABA data into the existing Class I Bond and Allotment (B&A) system as follows:

1. Preclude or reduce errors at point of origin.
2. Replace OCR scannable forms and related processing with a more reliable and productive means.
3. Produce input for the Class I B&A system identical to currently utilized optically scannable output format.
4. Provide for signature hard-copy ABA's which will be capable of producing microform image.

Sponsor. HQMC, Fiscal Director of the Marine Corps (CMC (Code FD)), Local Functional Manager: Disbursing Officer.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All FMF reporting units, field disbursing officers, and the Marine Corps Finance Center, as frequently as daily.

Description. The ABA data input via the Class IA ADPE-FMF application is a means of entering pay data such as bond purchase or allotment deductions to the Class I system.

Data Flow

Garrison. The ABA diskette will be produced at the reporting unit or the field disbursing office. The diskettes will be collected at the disbursing office and submitted to the RJE or RASC for input to the Class I System(s).

Deployed. In deployed situations the deployed disbursing office will be responsible for transmission of the transactions

to the Marine Corps Finance Center. Transmission will be by mail or couriered floppy diskette. The Marine Corps Finance Center will be responsible for entering the information into the Class I System and for distributing any output back to the deployed disbursing office as needed.

E. TRANSCRIPT OF DATA EXTRACTION (TODE)

Objective. Provide for the reporting of certain pay information by the disbursing office to the Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS). This application will reduce format errors, eliminate OCR scanner errors, and improve the accuracy and timeliness of reporting.

Sponsor. HQMC, Fiscal Director of the Marine Corps (CMC (Code FD)), Local Functional Manager: Disbursing Officer.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All USMC disbursing offices and the Marine Corps Finance Center on a daily basis.

Description. TODE's will be prepared at the Marine Corps Finance Center and at each field disbursing office. The existing format and edit techniques developed for OCR input and SCANDATA TODE applications are applicable. TODE's are transmitted via AUTODIN to the Marine Corps Finance Center for posting to JUMPS/MMS.

Data Flow

Garrison. The TODE originates in a field disbursing office and will be processed on the ADPE-FMF equipment. The floppy

diskette will then be taken to the RASC or RJE site for transmission.

Deployed. The deployed disbursing office will be responsible for transmission of the transactions to the Marine Corps Finance Center. Transmission will be by mail or couriered floppy diskettes. The Marine Corps Finance Center will be responsible for entering the information into the Class I System and for distributing any output to the deployed disbursing office as needed.

F. PAYMENT OPTION ELECTION (POE)

Objective. The POE is used by the disbursing office to designate an individual Marine's payment option. This application will reduce format errors, eliminate OCR scanner errors, and improve the accuracy and timeliness of reporting.

Sponsor. HQMC, Fiscal Director of the Marine Corps, (CMC (Code FD)), Local Functional Manager: Disbursing Officer.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All USMC disbursing offices and the Marine Corps Finance Center on a daily basis.

Description. POE's will be prepared at the MCFC and each field disbursing office. The existing format and edit techniques developed for OCR input and SCANDATA POE applications are applicable. POE's are transmitted via AUTODIN to the central site for posting to JUMPS/MMS.

Data Flow

Garrison. The POE originates in the field disbursing office and will be processed on the ADPE-FMF equipment. The output floppy diskette will then be taken to the RASC or RJE for transmission.

Deployed. The deployed disbursing office will be responsible for transmission of the transactions to the Marine Corps Finance Center. Transmission will be by mail or couriered floppy diskette. The Marine Corps Finance Center will be responsible for entering the information into the Class I System and for distributing any output back to the deployed disbursing office as needed.

G. MILITARY PAY VOUCHER (MPV)/MILITARY PAY LIST (MPL)

Objective. To enhance preparation and input of payment data by the disbursing office to the Joint Uniform Military Pay System/Manpower Management System (JUMPS/MMS) as follows:

1. Preclude or reduce errors at point of origin.
2. Eliminate OCR scanner errors or keypunch errors, and improve the accuracy and timeliness of reporting.
3. Produce input for JUMPS/MMS system identical to currently utilized optically scannable format.
4. Provide for signature hard-copy MPV's and/or MPL's which will be capable of producing clear microform images.

Sponsor. HQMC, Fiscal Director of the Marine Corps (CMC (Code FD)), Local Functional Manager: Disbursing Officer.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All FMF USMC disbursing offices and the Marine Corps Finance Center on a daily basis.

Description. MPV's and MPL's will be prepared at the MCFC and each field disbursing office. The existing format and edit techniques developed for OCR input and SCANDATA PUB and MPL applications are applicable. MPV's and MPL's are transmitted via AUTODIN to the central site for posting to JUMPS/MMS.

Data Flow

Garrison. The MPV and/or MPL originates in a field disbursing office and will be processed on the ADPE-FMF equipment. The output floppy diskette will then be taken to the RASC or RJE site for transmission.

Deployed. In a deployed situation, the deployed disbursing office will be responsible for transmission of the transactions to the MCFC. Transmission will be by such means as naval message or couriered floppy diskette. The MCFC will be responsible for entering the information in the Class I System and for distributing any output to the deployed disbursing office as needed.

H. MARINE AIR-GROUND FINANCIAL ACCOUNTING AND REPORTING SYSTEM (MAGFARS)

Objective. Provide edited input for the Class I MAGFARS and some local management reports prior to the implementation of

Standard Accounting Budgeting and Reporting System (SABRS).[10] MAGFARS incorporates the budgeting, accounting and reporting requirements for all FMF commands receiving O&M,MC money which is delegated as Marine Corps suboperating budget authorizations from the Force Commanders. The system also incorporates the Operating Forces Financial System (OFFS) requirements to account for and report stock drawback from the Fleet Stock Account by FMF organic units.

Sponsor. HQMC, Fiscal Director of the Marine Corps, (CMC (Code FDA)), Local Functional Manager: A C/S Comptroller and Consolidated Fiscal Accounting Office.

Designer/Programmer. MCCDPA, Quantico, VA.

Users.

1. First, Second, Third Marine Divisions
2. First, Second, Third Marine Aircraft Wings
3. First, Second, Third FSSG's
4. First Marine Brigade
5. Consolidated Fiscal Accounting Office, FMFLant, Camp Lejeune, NC.
6. Consolidated Fiscal Accounting Office, FMFPac, WestPac, Third FSSG, Okinawa, JA.
7. Consolidated Fiscal Accounting Office, FMFPac, EastPac, First FSSG, Camp Pendleton, CA.

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[10]SABRS is projected to be operational in October, 1984. It will replace MAGFARS and the incorporated OFFS.

8. Consolidated Fiscal Accounting Office, FMFPac, HI area, Kaneohe Bay, HI.

Description. The application provides on-line editing capabilities of financial transactions for 31 MAGFARS transaction-types with addition/deletion capabilities. It provides field-by-field and interfield editing for the transaction by means of tables and files. Also, it has the capability to group transactions by selected criteria and to forward these groups to MAGFARS for processing. In addition, the application has the capability to add or delete a transaction or group of transactions prior to submission to MAGFARS. The present editing routines within MAGFARS will be utilized as the base for the applications specifications.

Data Flow. The data flow reflects the current chain of command within the FMF. The local commander may choose to have cost centers submit their weekly input directly to the Consolidated Fiscal Accounting Office (CFAO) with a copy of the transmittal letter forwarded to the comptroller.

Cost Centers. The cost center is the lowest level for data entry. There are approximately 90 cost centers per major command (division, wing, FSSG, brigade). Input will be edited and accumulated daily on a floppy diskette and submitted weekly to the CFAO via the appropriate comptroller. Depending on location and volume, there may be some cost centers that will continue to submit their financial data manually to the

comptroller who will then enter the data via the ADPE-FMF equipment. Processing of SASSY input procedures will not change at this time.

Comptroller. There are ten comptrollers within the FMF (one at each division, wing, FSSG, and one at 1st Marine Brigade) plus two Force Headquarters Comptrollers (FMFLant, FMFPac). The ten major comptrollers will collect all their supporting cost centers' floppy disk input plus their own weekly input for submission to the CFAO. The comptrollers exercise management control over cost centers to ensure that all input for every cost center has been submitted. The two Force Comptrollers will collect all the floppy diskettes for the Force Headquarters plus all cost centers within the Force Headquarters for submission to the CFAO.

Consolidated Fiscal Accounting Office (CFAO). There are four CFAO's within the FMF. CFAO's will collect all the floppy diskettes from major command comptrollers. They will take all floppy diskettes including their own to the supporting RASC for aggregation and processing into the MAGFARS weekly cycle. The CFAO's will also be responsible for distributing output from the Class I System which is passed down from the RASC.

RASC. The RASC will aggregate and process the input and return the output to the CFAO.

ADPE-FMF Equipment Not Available. Where ADPE-FMF machines are not available, manual procedures will continue.

Displaced Units. When reporting units are not physically located near the comptroller or CFAO, they will courier their diskettes.

Deployed. When in deployed status the financial transactions created will be sent to the CFAO by whatever means available. Aboard ship some machines will be equipped with a paper tape punch to allow use of the naval message system. Floppy diskettes may also be sent by courier between the reporting unit and the CFAO. The CFAO will be responsible for input to the RASC and distribution to the reporting unit.

I. DISBURSING OFFICER VOUCHER (DOV)

Objective. To enhance input of disbursing voucher data into the present Class I DOV System by reducing errors at the source, which will improve the accuracy and timeliness of reporting.

Sponsor. HQMC, Fiscal Director of the Marine Corps, (CMC (Code FD)), Local Functional Manager: Disbursing Officer.

Designer/Programmer. MCCDPA, Kansas City, MO.

Users. All field disbursing officers on a daily basis.

Description. The application will allow edits and validation to be performed as voucher data is entered by the disbursing officer.

Data Flow

Garrison. The DOV originates at the field disbursing office and will be processed on the ADPE-FMF equipment. The

output floppy diskette will then be taken to the RASC or RJE for transmission. The data is then transmitted to the Marine Corps Finance Center for processing in the Navy Register System.

Deployed. The deployed disbursing office will be responsible for transmission of the transactions to the Marine Corps Finance Center. Transmission will be by whatever means available, such as naval message or by couriering the floppy diskettes to a shore activity for further transmission. The Marine Corps Finance Center will be responsible for entering the information into the Class I System and for distributing any output to the deployed disbursing office as needed.

J. SUPPORTED ACTIVITIES SUPPLY SYSTEM (SASSY)

Objective. To improve the using unit's data entry accuracy of SASSY transactions submitted to the SASSY Management Unit (SMU), and to provide timely management information independent of the supporting Automated Services Center (ASC).

Sponsor. HQMC, DC/S for Installations and Logistics, (CMC (Code LPS)), Local Functional Manager: SASSY Management Unit (SMU).

Designer/Programmer. CG, MCLB, Albany (Code P810), MCCDPA, MCLB, Albany, GA.

Users. The SASSY ADPE-FMF application is used on a daily basis by all FMF units with an organic Marine Corps supply account.

Description

Initial Development. This application automates the entry of SASSY transactions by prompting the user on what data to enter and validating data against locally stored information and predetermined values. The capability also exists to duplicate repetitive information. These factors improve the accuracy of transactions and reduce time required for data entry and error correction. In addition, data is maintained locally for the purpose of providing management information to the user.

Follow-on Development. Subsequent to the development of prompting and data validation, a unit will be provided with an inventory control system supported by the following SASSY files: Balance File; Open Document File Active Due and Status File (DASF); Loaded Unit Allowance File/Reporting Unit Allowance File (LUAF/RUAF); and Tailored Master Header Information File (MHIF). The above files will enable the using unit to generate timely management reports concerning the status of the supply account. The SASSY application will also be supported by a maintenance float application and fiscal journal.

Data Flow

Garrison. The using unit prepares and enters the SASSY transaction on the ADPE-FMF device which creates a transaction file on the device's floppy diskette. For those units located in the same geographical area, the floppy diskette will be couriered to the supporting SMU for data aggregation. For

those units not located in the same geographical location as the SMU, the transaction file will be delivered to the supporting FSSG detachment for aggregation (or as locally prescribed) and delivery to the RJE site for data conversion and transmission to the RASC. The aggregated transaction file held by the SMU is to be merged with those files received over the RJE for processing against the Class I SASSY system. Output will be distributed through the RJE and FSSG detachment (or as locally prescribed) for those units separated from the SMU and through the SMU for those units in the same geographical location.

Deployed. The using unit prepares and enters the SASSY transaction on the ADPE-FMF device which creates a transaction file on the device's floppy diskette. The floppy diskette will then be couriered to the supporting Combat Service Support Unit (CSSU) for data aggregation and processing. On ship, output which does not require further processing will be returned to the using unit to update local files. Transactions that require further processing by the SMU will be converted to paper tape and transmitted via naval message to the SMU for data aggregation. The aggregated transaction file will be delivered to the RASC for conversion to magnetic tape and processing against the Class I SASSY system. Output will be returned through the SMU and CSSU to the using unit through the reverse process.

K. MARINE CORPS INTEGRATED MAINTENANCE MANAGEMENT SYSTEM (MIMMS)

Objective. To improve the using unit's data entry accuracy of MIMMS transactions submitted to the Maintenance Management Unit (MMU), and to provide timely maintenance management support independent of the Automated Services Center (ASC).

Sponsor. HQMC, DC/S for Installations and Logistics, (CMC (Code LPS)), Local Functional Manager: Maintenance Management Officer/G-4/S-4.

Designer/Programmer. CG, MCLB Albany (Code P810) MCCDPA, MCLB, Albany, GA.

Users. The MIMMS ADPE-FMF application is used on a daily basis by all FMF units operating under the MIMMS maintenance management systems.

Description

Initial Development. This application automates the entry of MIMMS transactions by prompting the user on what data to enter and validating data against locally stored information and predetermined values. The capability also exists to duplicate repetitive information. These factors improve the accuracy of transactions and reduce time required for data entry and error correction. In addition, data is maintained locally for the purpose of providing management information to the user.

Follow-on Development. Subsequent to the development of prompting and data validation features, the MIMMS application will provide the unit with the following management reports:

Daily Process Report (DPR); Daily Transaction Listing (DTL); and LM2 Report. The above reports will enable the using unit to maintain the current status of items in the maintenance or supply cycle and provide the user with equipment readiness information.

Data Flow

Garrison. The using unit prepares and enters the MIMMS transaction on the ADPE-FMF device, which creates a transaction file on the device's floppy diskette. The floppy diskette will then be couriered to the supporting MMU for data aggregation by those units located in the same geographical area as the MMU. For those units not located in the same geographical area as the MMU, the transaction file will be delivered to the supporting FSSG Detachment for aggregation and delivery to the RJE site. There it will be converted to magnetic tape and transmitted to the RASC. The aggregated transaction file held by the MMU will be converted into magnetic tape by the RASC and merged with the file transmitted by the RJE. It will then be processed against the Class I MIMMS system. Output will be distributed through the RJE and FSSG Detachment for those units separated from the MMU and through the MMU for those units in the same geographical location.

Deployed. The using unit prepares and enters MIMMS transactions on the ADPE-FMF device. A transaction file is created

on the device's floppy diskette and the local maintenance management files maintained by the unit are updated. The floppy diskette will be couriered to the supporting CSSU for data aggregation and processing. On ship, transactions that require processing by the Class I MIMMS system are converted to paper tape and transmitted via naval message to the MMU for data aggregation. The aggregated transaction file will be delivered to the RASC for data conversion and processing against the Class I MIMMS system. Output will be returned through the MMU and CSSU to the deployed unit through the reverse process.

L. MARINE CORPS COMBAT READINESS EVALUATION SYSTEM SOFTWARE APPLICATION (MCCRESSA)

Objective. MCCRESSA automates the input process for the Marine Corps Combat Readiness Evaluation System and allows on site manipulation of the data. The system enhances the readiness evaluation process.

Sponsor. HQMC, DC/S for Plans, Policies and Operations (CMC (Code P)), Local Functional Manager: A C/S G-3.

Designer/Programmer. Computer Corporation of America. MCCDPA, Quantico, VA.

Users. All FMF commands that receive Combat Readiness Evaluations. Emphasis is placed on combat, combat support, and combat service support units at the battalion/squadron level.

Description. The Marine Corps Combat Readiness Evaluation System (MCCRES) provides the baseline for readiness reporting

within the Marine Corps. It is not uncommon for a Marine Amphibious Unit (MAU) MCCRES evaluation to generate 5000 separate data items. Each data item varies in importance (weight) thus making evaluation of the data very cumbersome, slow, and prone to human error. The MCCRESSA automates the process to increase the timeliness and accuracy of the data at the unit level and above. In addition, the application allows for the analysis of input at the unit level allowing commanders and evaluators to:

1. Rapidly identify deficiencies.
2. Identify trends.
3. Rapidly provide results.

Additionally, MCCRESSA will:

1. Identify, catalog, and print the alpha-numeric identification of mission performance standards (MPS), tasks and requirements contained within the MCCRES.
2. Provide a technique to assist in the evaluation of FMF commands based upon selected MPS's, tasks, and requirements.
3. Provide a quick compilation and analysis of unit readiness after a combat readiness evaluation.
4. Access unit evaluations to assist in the formulation of unit training objectives by inserting data bases for each functional command consisting of:
    a. Alpha/numeric listings with alpha identifiers for all nodes. Each node will be either a section, mission performance standard, task, or requirement.

b. Node hierarchy by designated percentages.

c. Command evaluations listed by results identified for requirement nodes as "yes," "no," or "not applicable."

d. Node hierarchy renormalized by percentages for "yes" and "no" nodes, while excluding "not applicable" nodes.

e. Node hierarchy eliminated by assigning same percentages to all nodes.

f. Analyzing each node based upon number of times "yes," "no," or "not applicable."

g. Listing nodes as "yes," "no," or "not applicable."

h. Designating unit evaluation index by section, mission performance standard, and task.

Data Flow. Users make primary input by transferring evaluator judgements from checklists to floppy diskettes. The diskettes are then forwarded to the RJE or RASC for input into the Class I system and forwarding to HQMC.

M. MESSAGE EDITING AND PROCESSING SYSTEM (MEPS)

Objective. To facilitate the preparation of pseudo-data messages from recorded AIS transaction information, and to provide a message composition and editing capability to unit communication centers.

Sponsor. Director, Command, Control, Cummunications and Computer (C4) Systems Division, (CMC (Code CC)), Local Functional Manager: Communications Electronic Officer.

Designer/Programmer. MCCDPA, Quantico, VA.

Users. MEPS is used by embarked units on a daily basis to assist in the transmission of message traffic.

Description. MEPS is a composition, editing and reformatting system that provides for the rapid submission of narrative and data traffic from the deployed unit through the Naval Communications System. MEPS does not form a part of any Class I system.

Data Flow. There are two application programs within MEPS: DAT (DATA) and MSG (TEXT). DAT accepts AIS transactions recorded on floppy diskettes in 80-column card image format. The afloat MEPS operator in the troop communications center constructs communications headers and trailers in order to send the transactions through the ship's communications center to the Naval Telecommunications System and AUTODIN. Similarly, MSG permits the operator to key narrative message forms directly into the machine for standard naval messages. Both DAT and MSG contain prompting and error-checking, and provide output on punched paper tape suitable for transmission over the teletypewritten equipment in shipboard and tactical communications centers. Message format, fully described in the MEPS User's Manual, is the modified ACP 126 teletypewriter standard. The MEPS operator assigns date-time groups, station serial numbers, Julian dates, time of file, and routing information through the keyboard in response to prompting from the Cathode Ray Tube (CRT) screen.

APPENDIX C

APPLICATIONS DEVELOPMENT AND DOCUMENTATION PROCEDURES

A. PURPOSE

Automated Data Processing Equipment for the Fleet Marine Force (ADPE-FMF) is being provided to the battalion/squadron commander primarily to enhance the input process to Class I systems. Since the small unit commander now has this data processing capability, a strong and effective management tool has been placed at his fingertips. The SDA devices in the ADPE-FMF have limitations, but they also represent a vast new resource to be tapped by the commander and his staff. Those users who view ADPE-FMF as "only a SDA device" will be losing a wealth of potential. Those who strive to make these devices become their own management tool will find more and more areas where computing power can be brought to bear on everyday tasks. This appendix establishes procedures for the development and documentation of local applications (Class IV software systems) designed by/for the battalion/squadron command and/or his staff.

B. MANAGEMENT PROCEDURES FOR DEVELOPMENT

1. General

Specific managerial procedures are necessary in order to ensure the effective development of local applications. These procedures will assist the local user and will provide

for the successful development of efficient applications for information management, report generation, and other local needs. These procedures are provided as a guide to ensure completeness in the development process. Some steps will be nothing more than a thought process for the ISC. However, close adherence to these procedures will aid the ISC in justifying expenditures in personnel and materials. More importantly, close adherence will ensure an orderly development process, rather than aimless attempts to satisfy user needs.

2. Organization

In order to avoid haphazard efforts at applications development, the user should appoint, in writing, an officer or staff noncommissioned officer to be responsible for Class IV applications development within the unit. This individual would be responsible to the commander for the overall employment of ADPE-FMF within the unit, including the development of local applications. He would work closely with the ISMO in the execution of the procedures listed below. The title of Information Systems Coordinator (ISC) is used in this appendix to refer to the individual described above.

3. Procedures

The following paragraphs describe the procedures to be followed in the development of local applications software.

a. Step 1: Project Definition

(1) Formulation of the Concept. When it has been determined that a requirement for a new application or

change/improvement of a current application exists, conduct an informal analysis in order to validate the requirement. In reality, most requests will come to the ISC from the commander or his staff. In this case only a clarification may be necessary.

(2) Approval of the Concept. Upon validation of the requirement in concept, obtain the commander's approval of the commitment of necessary additional resources required to prove or disprove the approach presented in concept. Ordinarily, no additional resources are required. However, the ISC must weigh his organic assets (i.e. self-taught programmers) against the request. Early contact with the ISMO may be necessary.

(3) Development of the Application Plan. The ISC must identify how the system will accomplish the desired objectives and clarify the technical and operational feasibility of the development effort. That is, the ISC must decide whether or not the project appears small enough for completion at his level. The ability to make this determination may rest with the ISMO. It is imperative that the ISC determine whether he can conceivably accomplish the task with his own assets. If not the ISC can go immediately to the ISMO rather than waste man-hours needlessly.

(4) Approval of the Application Development. If the ISC determines that local assets are sufficient, he must

obtain the commander's approval to commit the necessary resources to proceed with formal analysis and design.

b. Step 2: Analysis and Design

(1) Analysis and Design. The ISC will develop the concept for the application by preparing the following:

Flow charts reflecting system logic.

Input/output specifications.

Internal arithmetic and decision logic functions and tables defining computations.

Criteria for accuracy of input data, computations, and output data.

Internal and external systems interface requirements.

System and security controls.

(2) Approval. Obtain the commander's approval of the design and his authorization to continue development.

c. Step 3: Programming/Testing/Debugging

(1) Program/Test/Debug. The ISC will probably require the support of the ISMO throughout this period. The system must be programmed and run in its actual system environment using live data. Technical and user documentation must be used to ensure thorough testing is accomplished. Every effort should be made to prove that the system does not work properly. An aggressive effort to break the new system is perhaps the best test of that system's capabilities. Bugs not located during this phase will contaminate the system once implementation is completed.

(2) Test Acceptance. The ISC must certify that the system test is successful. This should not be viewed as a mere formality. When the test is termed successful, the certifying authority indicates that the system will do exactly what it was designed to do.

(3) Implementation Request. Subsequent to acceptance of the system tests, a request for full implementation is made.

d. Step 4: Implementation

Operational implementation of the system includes field guidance from the ISC to all users. Naturally, this involves the proper distribution of technical and user documentation. But it also includes personal involvement on the part of the ISC. He must ensure that the users are using the system as it was designed to be used. The system can be contaminated by users who try to hold on to old methods. The ISC must also be alert for problems which arise when user needs are not properly satisfied during the design phase.

e. Step 5: System Reviews

The actual system user must provide operational review reports to the ISC to indicate whether the user's needs have or have not been acceptably satisfied. Requests for additional changes/improvements must be identified to the ISC. All constructive comments will aid the ISC in future development efforts.

C. DOCUMENTATION

1. General

Proper documentation of user-written software is absolutely essential for the proper execution of that software. The methods applied to software design, development, and implementation are often as varied as the number of persons involved. For that reason, documentation standards must be closely followed. This will aid in maintenance of the software, provide for sharing of the software with distant units, and allow the adapting of applications to other similar needs.

Maintenance of the software is made easier if the programmer has a written, external record of the "what" and "how" of the system. The programmer can quickly identify the methods of the designer and will be able to follow the program logic more readily. This ensures faster location and correction of program deficiencies.

Sharing of software is facilitated, since the documentation package is complete with all necessary instructions. New users can load and operate the program with no help from the designer or from other users.

Users who receive the documentation package but who decide that the program is not exactly what they need can easily change the program to meet their needs. Since the thoughts and intents of the original designer are included, little time is spent modifying the logic for a different but similar application.

2. Required System Documentation

A summary of the required documentation for Class IV software is presented below.

a. ADPE-FMF Applications Software Summary

The software summary should be completed by the individual who designs and/or programs the software at the local site. It should be forwarded to the ISMO upon implementation of the system. The ISMO will forward the summary to MCDSA for inclusion in the Class IV library. The Applications Software Summary is depicted in Figure C.1. Block 17 will contain the narrative located in the REMARKS section of the applications program if summarizing an individual program. If the summary pertains to a software system (more than one individual program) complete one summary for the overall system and list all programs included in the system. Then, complete a separate software summary for each of the programs in the system. If the program generates hard-copy output, attach a sample of that output.

b. Operator's Guide

This document is intended for the current user's benefit. It is created as a turnover document to ensure continued operation in the event of personnel turnover. This document is a must. At a minimum it should include:

(1) System overview.

(2) Operating instructions.

<table>
<tr><td colspan="3"></td></tr>
<tr><td>01. SUMMARY DATE
YR MO DA</td><td colspan="2">02. SOFTWARE TITLE</td></tr>
<tr><td>03. SOFTWARE CLASS</td><td colspan="2">04. TECHNICAL POINT OF CONTACT (NAME/PHONE)</td></tr>
<tr><td>05. SUMMARY TYPE
( ) AUTOMATED DATA SYS
( ) COMPUTER PROGRAM
( ) SUBROUTINE/MODULE</td><td colspan="2">06. ORGANIZATION AND ADDRESS RUC:___________</td></tr>
<tr><td rowspan="2">07. SUMMARY ACTION
( ) NEW
( ) REPLACEMENT
( ) DELETION</td><td>08. SOFTWARE I.D.</td><td>10. FUNCTIONAL AREA</td></tr>
<tr><td colspan="2">09. NONSTANDARD REQUIREMENTS(HARDWARE/SOFTWARE)</td></tr>
<tr><td>11. PROGRAM LANGUAGE</td><td>12. NO. OF SOURCE STMTS</td><td>13. MAXIMUM COMPUTER MEMORY REQ.</td></tr>
<tr><td>14. FILES USED</td><td colspan="2">15. SYSTEM DOCUMENTATION AVAILABLE (LIST ALL COMPLETED)</td></tr>
<tr><td colspan="3">16. SUBPROGRAMS/SUBROUTINES (LIST)</td></tr>
<tr><td colspan="3">17. NARRATIVE (ATTACH ADDITIONAL SHEETS IF NEEDED)</td></tr>
<tr><td colspan="3">18. FOR SUBMITTED ORGANIZATION USE</td></tr>
</table>

Figure C-1. Applications Software Summary

(3) Sample screen displays.

(4) Sample hard-copy output.

(5) Source code listings.

c. User/Operator's Manual (UOM)

The UOM is to be completed by the application sponsor (usually the ISC for Class IV development) with the active participation of ADP personnel. The UOM is designed to provide the user's non-ADP personnel with the information necessary to effectively use and operate the system.

3. Format for the User/Operator's Manual (UOM)

The UOM is not a required document for Class IV applications software developed by echelons below the ISMO level. The operator's guide is probably sufficient if it is well prepared and kept current. However, the user should make every effort to provide documentation to the detail required in the UOM. Such detail will eliminate the possibility of new personnel finding inadequate turnover files, and will greatly extend the useful life of Class IV software.

In fact, the documentation referenced in paragraphs B.1 and B.2 above represents a large portion of those items included in the UOM. By completing the UOM, the user will have a well-structured, logical document which will aid current and potential users, whether local or Marine Corps-wide. Completion of the UOM results in a product which can be included in the Class IV systems catalog, represents a reduction in

development time for users with similar needs, and provides much impetus to the overall ADPE-FMF system concept.

A discussion of the UOM format is presented below. Figure C.2 reflects the general contents of the UOM. The following paragraphs provide a verbal description of each section shown in the general contents.

a. Section 1. General

(1) Purpose of the UOM. This paragraph describes the purpose of the UOM in words similar to those following:

The objective of this UOM for (project name) (project number) is to provide non-ADP personnel with the information necessary to effectively use this system.

(2) Project References. Provide a brief summary of all references as appropriate. Describe the general nature of the program. Include a brief description of purpose and use of the program. List all applicable documents. Specify the following by author or source, title, and security class.

Project request.

Previously published documentation on the project.

Documentation concerning related projects.

Standards or reference documentation.

(3) Terms and Abbreviations. Provide a list of terms, definitions, or acronyms unique to this document and subject to the user's interpretation.

Figure C-2. General Contents of the UOM

(4) Security and Privacy. Describe classified components including inputs, outputs, data, and computer programs. Prescribe any privacy restrictions on the use of the data.

b. Section 2. System Summary

(1) System Application. Explain the uses of the ADS in supporting the activities of the user and his staff. Include:

The purpose, reason, or rationale of the system.

Capabilities and operating improvements provided.

Additional features and advantages derived from the system.

Functions performed by the system, such as maintenance of files, display of targets, etc.

(2) System Operation. Include charts and a brief narrative to indicate the flow of data inputs and outputs of the system. Define the who, what, where, and why concerning the inputs and outputs on the chart.

(3) System Configuration. Provide a brief narrative of the equipment used by the system.

(4) System Organization. Present a general overview of the organization of the system. Show the logical parts of the system and a brief description of their role.

(5) Performance. Describe the overall performance capabilities of the system. How does the system meet the requirements of the user it supports? Include such items as types, volumes, and rates of input/output, response times,

limitations, error rates, processing time, flexibility, and reliability.

(6) File Inventory. List all permanent files that are referenced, created, or updated by the system.

(7) Description of Inputs, Processing, Outputs. Present a general narrative description of the inputs (purpose, content, origin, etc.), the flow of data through the processing cycle, and the resultant outputs (purpose, content, distribution, etc.).

(8) Program Inventory. Provide a tabular inventory of various programs, including name, program ID, and classification.

c. Section 3. Operating Procedures

(1) Overview. Explain the basic operating procedures for each program in the system. Refer to the standard items as shown in the following pages.

(2) Program Initiation. Present a reference to Exhibit 1 for the detailed description of program initiation procedures.

d. Appendix A

This appendix is used to graphically illustrate the various users of the system and how those users interface with the system at all points. A system flowchart indicating the user's direct or indirect interaction with the software system and other manual and/or computerized systems is required.

e. Appendix B

This appendix will contain data dictionaries and record layouts for all files utilized by the system. Sample Data Dictionaries and File/Record layouts are shown in Figure C.3.

f. Appendix C

This appendix includes a listing of all error messages generated by the software system. It should include the abbreviated error condition code and a narrative description of that code. A sample format is shown in Figure C.4.

g. Exhibit 1

This exhibit is used to describe the procedures to be followed in order to invoke the individual programs contained in the system. Two formats should be used. One format, shown in Figure C.5, includes a step-by-step narrative. The second format, Figure C.6, consists of a completed standard form.

h. Exhibit 2

This exhibit is used to present a summarized list of program prompting messages with the appropriate operator responses. A reference page number is also used to direct the operator to the section of Exhibit 3 which will contain detailed program prompting messages and error recovery procedures for each prompt. A sample program prompting procedure is included as Figure C.7.

FIELD-NAME	TYPE*	LENGTH	START-POSITION	END-POSITION
LNAME	A	20	1	20
FNAME	A	10	21	30
INIT	A	1	31	31
SECTION	X	4	32	35
RANK	X	6	36	41
DOB	9	6	42	47

*The Type will be:

'9' for numeric data

'A' for alphabetic data

'X' for alphanumeric data

Figure C-3. Sample Data Dictionary and File/Record Layout

CODE	EXPLANATION
ERR01	Data contains space in last position
ERR02	Data contains space in first position
ERR03	Data date is greater than unit diary date
ERR04	Invalid time entered
ERR05	Invalid data type
ERR06	Invalid date entered
ERR07	"FROM" date greater than "TO" date
ERR08	Error in statement on format file
ERR09	Invalid operand
ERR10	File name not found

Figure C-4. Sample Format, Error Condition Codes

UNIT DIARY EXTRACT

1. Load your unit's personnel master file in drive #1
2. Load unit diary diskette #2 in drive #2
3. Enter in position 1 thru 6 "UDODJ1" in position 9 enter "2" in position 11 thru 14 "UDO2"
4. Press green function select and key 'E'
5. When first prompt message is displayed it reads: "PRESS Y = PERSONNEL FILE HAS BEEN LOADED" Then press 'Y' to reply file is loaded
6. When second prompt message appears, select option
7. At EOJ a flashing '100' will appear on the screen. Press "RESET" and remove the diskettes

Figure C-5. Sample Format, Step-by-Step Narrative

JOB NAME Unit Diary PROG NUMBER ____

PROGRAM: STORAGE DATASET NAME UDOBJ1 PROGRAM NAME UD03

MOUNT DISKETTES: DRIVE 1 Unit Diary Diskette #1

DRIVE 2 Unit Diary Diskette #2

PRINTER SETUP 1 Part Wide (612)

ACTIVATING THE PROGRAM Step-by-step Setup

PROGRAM RESTART PROCEDURE Same as above

SOURCE DOCUMENTS Ref: MCO P1080.35C (PRIM) par. 1005

WHO TO CONTACT IF:

SOURCE DATA INVALID Reporting unit's Admin Chief

PROGRAM MALFUNCTIONS 1st RASC SDA Section

ENDING THE JOB See step-by-step setup or key effect below

ABORTING THE JOB Same as ending, above

OPERATING KEYS USED BY THE PROGRAM. (KEYS NOT LISTED ARE NOT USED AND MAY CAUSE ERRORS) Right adjust, Field backspace, Field advance, Record backspace, Duplicate and Select program

EFFECT OF PROGRAM CONTROL KEYS AND SWITCHES (IF ANY):

KEY	EFFECT
Right Adjust	Exits prompt
Field Backspace	Allows reentry of previous prompt
Select Program	Terminates program and chains directly to next program
Record Backspace	Cancels current statement request
Field Advance	Allows program acceptance of entered data which has been flaged as error
Duplicate	When in correction loop for a statement this will allow duplication of data already correctly entered without rekeying

Figure C.6. Program Procedures, Standard Form

	PROMPT	RESPONSE	PAGE
1.	ENTER TODAY'S DIARY DATE IN THE FORM YYMMDD	Enter the Unit Diary's date	G.9
2.	ENTER TODAY'S UD #	Enter the appropriate Unit Diary number	G.14
3.	ENTRIES CORRECT, Y=YES, N=NO	Enter 'Y' or 'N'	G.15
4.	FIELD BKSP TO RETRY, FIELD ADV TO ACCEPT OR SEL PROG TO ABORT JOB	Select option desired	G.10
5.	INVALID RESPONSE BY OPERATOR PRESS "FIELD BKSP" KEY TO RETRY, OR "SEL PROG" KEY TO ABORT JOB	Previous response by operator was invalid Please respond with one of the indicated option responses	G.8
6.	IS DATE CORRECT, Y=YES N=NO	Enter 'Y' or 'N'	G.11
7.	IS TODAY'S UD # CORRECT, Y=YES, N=NO	Enter 'Y' or 'N'	G.13
8.	NO SSN FILE, BEGINNING EXTENTS = END OF DATA EXTENT, PRESS "SEL PROG" TO ABORT JOB, "REC ADV" TO CONTINUE W/O SSN FILE	Select option desired	G.15
9.	PRESS "FIELD BKSP" TO RETRY OR "SEL PROG" TO ABORT JOB	Press Field Bksp to retry previous entry or Sel Prog to cancel job	G.12
10.	TO CREATE OR MODIFY A WORKING DIARY, KEY ONE OF THE FOLLOWING: 1=CREATE, 2=MODIFY, 3=INSERT STMTS, 4=ALLOW ADDS AT END	Select the appropriate option desired	G.7

Figure C-7. Sample Program Prompting Procedures

i. Exhibit 3

This exhibit reflects detailed prompting messages and error recovery procedures. It is used to describe to the system operator the specific information about the field currently being prompted that must be known in order to respond to the prompt correctly and to recover from an input error should one occur. The proper format is shown in Figure C.8.

DOCUMENTATION FOR OPERATOR - FIELD DOCUMENTATION PROGRAM UD03

FIELD MESSAGE: To create or modify a working diary, key one of following:

DATA TO ENTER: "1"=create "2"=modify "3"=insert "4"=add at end

SPECIAL INSTRUCTIONS: Right adjust to exit

CHECKING DONE BY PROGRAM: Numeric and must be 1,2,3,or 4

EFFECT OF SPECIAL EXIT KEYS (IF ANY):

KEY	EFFECT
Right adjust	Exit field
Sel prog	Abort job

EFFECT OF PROGRAM CONTROL KEYS (IF ANY):

KEY	EFFECT

ERROR MESSAGES	ACTION TO TAKE
90	Invalid key pressed- press "RESET"

Figure C.8. Special Prompting Instructions

APPENDIX D

COMMUNICATIONS FOR ADPE-FMF

A. GENERAL

Every ADPE-FMF device is capable of communicating with any other ADPE-FMF device provided that a suitable communications link exists between them. Each device comes equipped with two communications interfaces which enables the device to be compatible with nearly every available means of communications. These two interfaces, called ports, provide both digital and modulated signals which can be interfaced with other equipment. The digital and modulated ports enable the SDA device to interface directly with the garrison telephone system as well as field radio equipment.

1. Digital Port

The digital port is a pair of wires which come directly from the ADPE-FMF device's Programmable Communications Subsystem (PCS). The PCS is a printed circuit board within the device which provides a digital signal at speeds up to 9600 bits per second (bps).

2. Modulated Port

To create the signal available from the modulated port, the ADPE-FMF device passes the digital signal through a modem which modulates the digital signal to voice frequencies. The

modulated signal is then passed through a Federal Communications Commission (FCC) certified Direct Access Arrangement (DAA) which protects against harmful voltages and frequencies. The resulting signal at the modulated port is provided through a six pin data jack (Model RJ41S). Associated with the modulated port is the modulated port adapter which connects to the RJ41S data jack and provides the same modulated signal on a pair of wires.

B. COMMUNICATIONS IN GARRISON

1. Courier

The first and simplest method of communications in garrison is by the couriering of flexible diskettes to the appropriate receiving site.

2. Wire

The second method is through the use of wire or coaxial cable to directly link two ADPE-FMF devices. The direct link utilizes the modulated port (with adapter) on each device and provides maximum data rates (up to 9600 bps), as well as minimizing data transmission errors associated with other means of transmission.

3. Telephone

The third method utilizes the telephone system and is the best solution when feasible, because it is the cheapest and most flexible. Through the telephone system the device can transmit data to any other similarly connected ADPE-FMF device. Before the battalion/squadron can access the telephone

system with ADPE-FMF, two minor modifications to the local telephone must be made. A special jack must be installed (Model RJ41S is required and costs about $2 plus installation costs) and the telephone set must be replaced with a telephone set which has an exclusion key. The exclusion key allows the telephone to be used for data as well as for voice communications. When both of these modifications have been made, the device's modulated port is connected to the installed data jack. The procedure for using the telephone system is quite simple. Dial the site to which you desire to transmit data. After the receiving party answers the telephone, both parties switch their telephone sets to data by lifting the exclusion key on the telephone set. Both ADPE-FMF devices are then ready for data transmission.

C. COMMUNICATIONS WHILE DEPLOYED

1. Courier

Deployed FMF units have four methods of transmitting data when ashore. The first is by couriering diskettes, subject to limitations. The deployed unit may be required to courier data over long distances or through enemy held ground. However, where reliable courier service (ground or air) is available, this method can be highly effective when confronting an electronics warfare (EW) threat.

2. Wire

The second method utilizes the unit's field wire system when available. The simplest wire method is to attach the ADPE-FMF modulated port (with adapter) directly to the field wire system. In field tests the transmission of data was effective with up to 11 miles of WD-1 slash wire before distortion and attenuation made the signal difficult to receive accurately. By placing C-161 loading coils (organic to communications units) on the wire, distortion can be reduced, yielding a clearer signal for a greater distance. Whenever wire is used, any of the device's data rates are acceptable.

An alternate but less effective method for wire is to connect the ADPE-FMF device to the field wire system in a manner similar to present Marine Corps teletype equipment (e.g. AN/TGC-14). This interface connection is relatively simple. The device's digital port is connected to a TH-85/GCC telegraph converter (organic to every battalion/squadron communications section). The TH-85 is then connected to the unit's wire system. This method requires the slowest data rate, 75 bps.

3. Single Channel Radio

The third method utilizes single channel radio (HF, VHF, and UHF). Currently, the most common HF radio is the AN/PRC-47 which has the ability to transmit and receive teletype, provided it is equipped with a CV-2455 Converter Blower. ADPE-FMF will connect to the AN/PRC-47 HF radio in a fashion

similar to teletype equipment. The computer's digital port is directly connected to the CV-2455 Converter Blower. All other single channel HF, VHF, and UHF radio sets are constrained by the physical requirement of push to talk. This physical requirement can be overcome by a procedure known to communications officers as a Radio Wire Integration (RWI) hookup. This procedure involves connecting ADPE-FMF to a remote control (AN/GRA-39 for VHF and AN/GRA-6 for HF).

4. Multichannel Radio

The fourth method of data transmission for ADPE-FMF is through multichannel radio. A typical example of Marine Corps multichannel equipment is the AN/MRC-134 radio which has four voice channels and four teletype channels. ADPE-FMF can utilize any of the four voice channels by connecting the device's modulated port with adapter directly to the unit's switchboard using ordinary field wire. The switchboard will provide the necessary link to the AN/MRC-134. Data communications over the AN/MRC-134 voice channel may be transmitted at any of the prescribed ADPE-FMF speed settings. However, slower speeds will yield more reliable communications. To utilize the AN/MRC-134 teletype channel requires that the device be set at 75 bps. The device's digital port is connected to a TH-85 which in turn is directly connected to the AN/MRC-134's teletype terminal. The voice channel provides better quality transmission at greater speed and is the preferred method when available.

D. COMMUNICATIONS AFLOAT

Deployed FMF units have a variety of communications means available when afloat. During periods of Emissions Control (EMCON), couriering is the only means available to transmit data, providing reliable but untimely results. For normal communications between ships, each ship has a switchboard with access to voice frequency radio channels between the various ships in the task force. If both the transmitting and receiving ADPE-FMF device can connect their modulated port with adapter directly to the ship's switchboard, a reliable data communications link should result. For communications to higher headquarters, the deployed unit may be provided with a paper tape punch which will punch the required data in message format into paper tape. The resulting paper tape can be taken to the ship's communications center where it is transmitted via satellite to the nearest Naval Communications Station. There the message is entered into the Automatic Digital Network (AUTODIN) where it is transmitted to the appropriate receiving AUTODIN station. The ADPE-FMF device does not have the ability to read paper tape; hence any transmissions to the deployed unit must be in the form of narrative messages.

E. PROCEDURE FOR ADPE-FMF ASYNCHRONOUS DATA TRANSMISSION

These are the procedures for the transmission of data by the ADPE-FMF via slash wire, data phone, and switchboard.

Before the transmission of data, the paper tape punch device must be disconnected.

1. Data Transmission Via Slash Wire

    a. Plug the signal cable P/N 7937766 into the receptacle labeled "COMM" on the back of the display processing unit.

    b. Connect the signal cable to the two terminals on the C-161 coil labeled "SWITCHBOARD."

    c. Connect the slash wire to the terminals on the C-161 coil labeled "LINE."

    d. Insure the signal cables are connected to the C-161 coils shown in the diagram.

    e. Load desired program.

Figure D.1. Data Transmission Via Slash Wire

2. Data Transmission Via Data Phone

a. Plug the signal cable P/N 7937766 into the receptacle labeled "COMM" on the back of the display processing unit.

b. Connect the signal cable to the two terminals on the C-161 coil labeled "SWITCHBOARD."

c. Connect the slash wire to the two terminals on the C-161 coil labeled "LINE."

d. Located near the telephone is the "VOICE/DATA" switch. Turn the switch to "DATA."

e. Establish voice communication.

f. Both parties pull up the exclusion button on the telephone cradle and lay the receiver down next to the telephone (not in the cradle).

g. Load desired program.

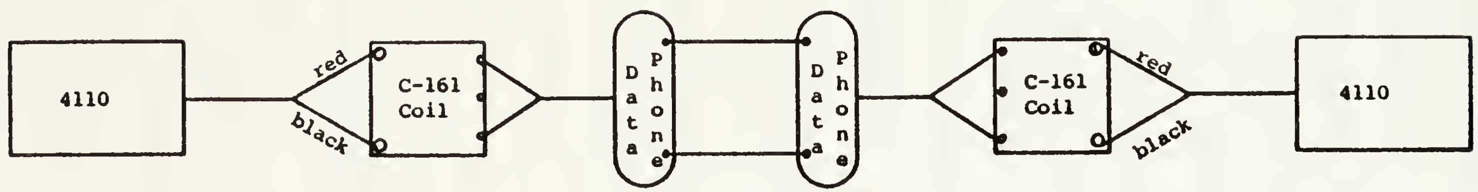

Figure D.2. Data Transmission Via Data Phone

3. Data Transmission Via Switchboard

a. Plug the signal cable P/N 7937766 into the receptacle labeled "COMM" on the back of the display processing unit.

b. Connect the signal cable to the two terminals on the C-161 coil labeled "SWITCHBOARD."

c. Connect the two terminals on the C-161 coil labeled "LINE" to the desired channel connections on the switchboard, i.e., channel 2.

d. Further procedures, listed below, depend upon type of switchboard used:

SB3614 Switchboard:

e. Establish voice communication on the channel over which you intend to send/receive data (i.e., if you are sending/receiving over channel 2, depress switchboard buttons CALL/ANS, 102).

f. Open the channel your 4110 is connected to by depressing the appropriately numbered switchboard buttons (i.e., channel 5 would be keyed 105).

g. Depress the operator release button on the switchboard.

h. Call the sending/receiving switchboard on an unused channel to coordinate the loading of COMSEND/COMRECV program (i.e., if channel 1 is unused, depress

CALL/ANS button then key 101 on the numbered switchboard buttons).

i. Load desired program.

SB22 Switchboard:

e. Establish voice communication on the channel over which you intend to send/receive data (i.e., if you are sending/receiving over channel 2, insert operator plug into channel 2 jack).

f. Establish voice communication over an unused line to coordinate loading of COMSEND/COMRECV (i.e., move operator jack to channel 1 plug).

g. Open the line your 4110 is connected to by inserting the line plug into the corresponding line jack (i.e., 4110 is connected to channel 4, insert the channel 4 plug into the channel 4 jack).

h. Load desired program.

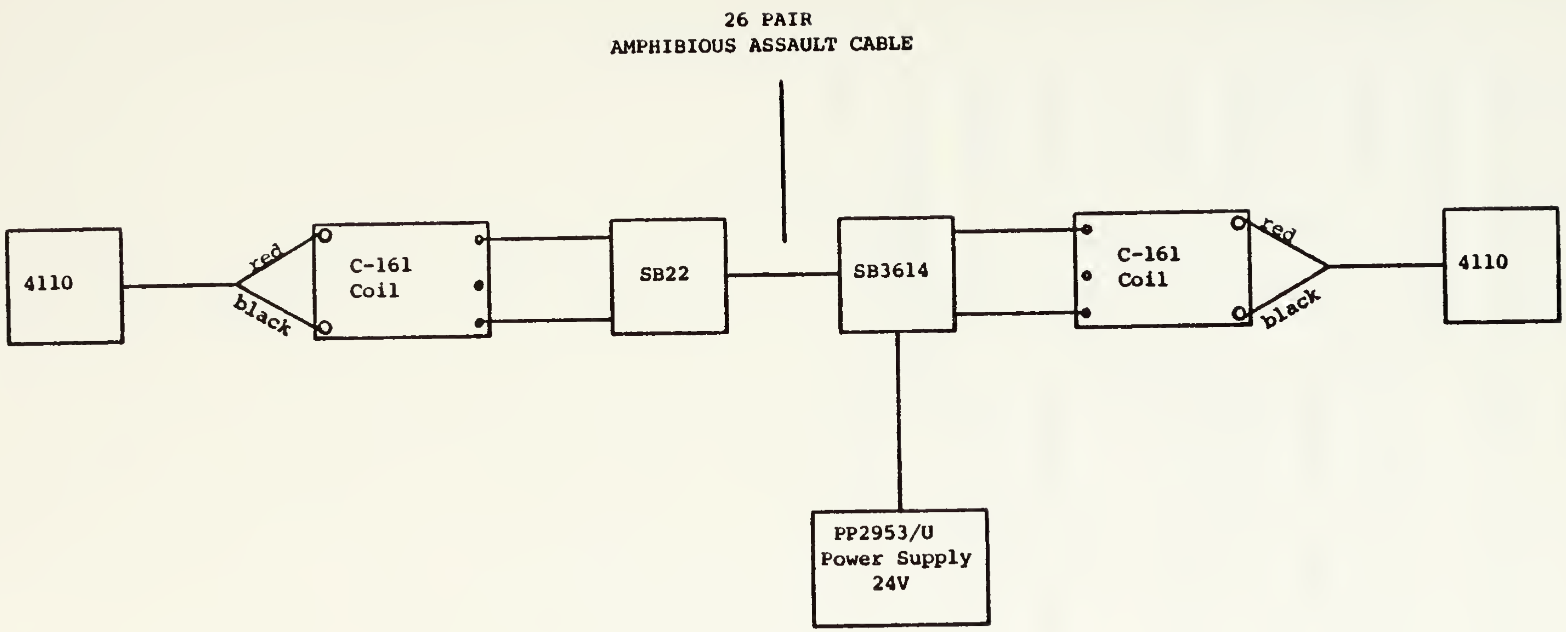

Figure D.3. Data Transmission Via Switchboard

4. Data Transmission Via Jeep Mounted Radio

a. Plug the signal cable P/N 7937766 into the receptacle labeled "COMM" on the back of the display processing unit.

b. Connect the signal cable to the two terminals on the C-161 coil labeled "SWITCHBOARD."

c. Connect the two terminals on the C-161 coil labeled "LINE" via slash wire to the send/receive channel on the jeep radio.

d. Establish voice communications over an unused channel on the jeep radio to coordinate the loading of COMSEND/COMRECV.

e. Load desired program.

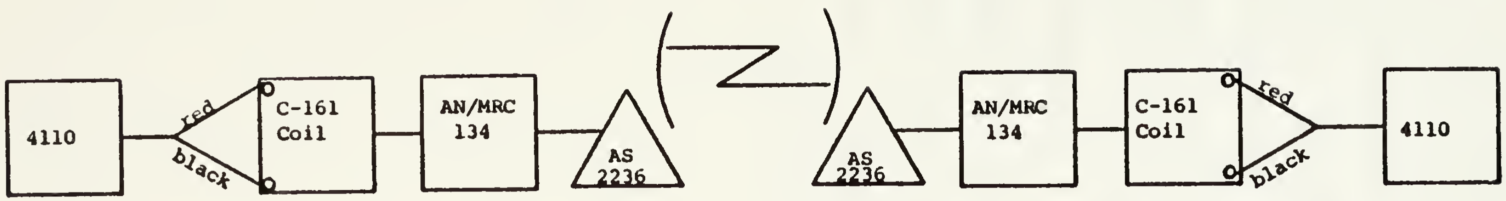

Figure D.4. Data Transmission Via Jeep Mounted Radio

5. <u>Data Transmission Via Jeep Mounted Radio With Switchboard</u>

a. Plug the signal cable P/N 7937766 into the receptacle labeled "COMM" on the back of the display processing unit.

b. Connect the signal cable to the two terminals on the C-161 coil labeled "SWITCHBOARD."

c. Connect the two terminals on the C-161 coil labeled "LINE" to the desired channel connections on the switchboard, i.e. channel 2.

d. Connect the switchboard via slash wire to the send/receive channel on the jeep radio.

e. Further procedures depend on type of switchboard used, as explained under E.3 above.

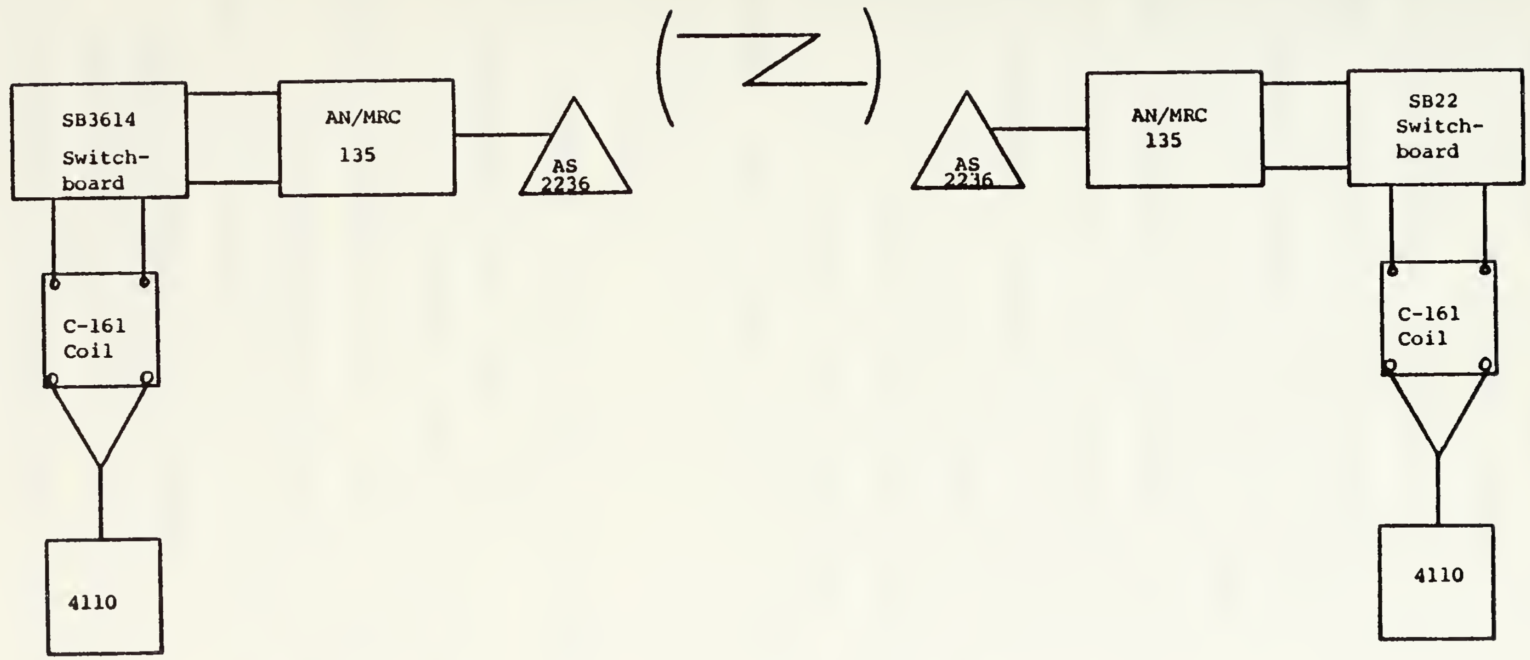

Figure D.5. Data Transmission Via Jeep Mounted Radio With Switchboard

F. REMOTE JOB ENTRY

From time to time the commander may be required to input data directly into the Class I system. This capability will be facilitated through the Remote Job Entry (RJE) utility ($RJEUSMC). The utility is a modified version of the IBM $RJE2780 utility program. It is designed to provide the user with the ability to transmit job streams to the IBM 360 computer, and is available from MCDSA, Quantico, Virginia. Input to this program can reside on diskette and/or magnetic tape. The RJE utility is designed to be executed on the ADPE-FMF device with the following equipment or features required:

a. The Binary Synchronous Attachment Feature 2074.

b. The Display Processing Unit, including keyboard, video screen, 64K storage, diskette drive, and magnetic tape drive if required.

c. Printer.

d. Modems and EIA data set cables (types depend on type of communications lines used).

e. Communications lines (can be commercial or Marine Corps owned telephone lines, and/or communication slash wire).

f. The mainframe must have a transmission control unit or other type of communications control unit.

1. Establishing An RJE Terminal

When considering the 4110 display processing unit for use as an RJE data communications terminal, several items must be considered. These include:

a. Authorization to modify configuration (if not previously granted).

b. Procurement of the 2074 BISYNC Controller, J3 connector.

c. Determination of type of communication lines to be used and subsequent installation.

d. Procurement of modems and EIA data set cables. The EIA data set cables are available from IBM, feature 2051, at a cost of approximately $72.00.

e. Coordination with the host ASC to have the proper settings in the data communication controller used by the ASC.

f. Availability of ports in the host communication controller.

2. <u>2074 BSC, J3 Connector</u>

This attachment must be procured from IBM at an approximate cost of $1,239.00. Coordination with the ISMO is recommended.

3. <u>Communication Lines</u>

The communication lines used will depend upon availability, and/or cost.

a. Commercial or Marine Corps owned telephone lines

Telephone lines, either commercial or Marine Corps owned, are most convenient for use. The type of line to select, dial up or direct connection, will depend on availability of line pairs and cost of associated equipment, such as data phones, direct access arrangements, and modems.

(1) Dial Up Lines. Presently installed lines can be utilized with the addition of DAA's, data phones, and modems. This type of line can be used at a baud rate up to 9600. The modems required for a dial up line are considerably more expensive than modems that can be used with a direct line. Additionally, the cost for the DAA's, which depends on whether the DAA is purchased or leased, may be more than the cost of a direct line.

(2) Direct Lines. In order to have direct lines installed for use with data communications, there must be available unused telephone lines both at the 4110 display processing unit site and at the host CPU site. If unused lines are not available, additional telephone cables could be installed, at Marine Corps expense, at either or both sites. A direct line does not require DAA's or data phones and the line costs are minimal when both sites are on the same telephone exchange. The limited-distance modems can be used with a direct line if the distance does not exceed 20 line miles. The cost of a limited-distance modem is much less than that of the type modem required for dial up lines.

b. Marine Corps Installed Lines

The Marine Corps could install lines, utilizing slash wire or equivalent, for data communications use. The modems required would be the same as for a direct line. This method might be practical for short distances or when line poles or other carriers are available; otherwise, this method could be cost prohibitive.

APPENDIX E

GLOSSARY

Asynchronous. A characteristic of devices that operate at arbitrary times, possibly determined by the actions of other devices.

Automated Data Processing System (ADPS). An aggregation of software and the resources required to support it. The ADPS includes one or more Automated Data Systems (ADS) and generally has a distinct suit of hardware associated with it. The configuration of an ADPS can be all ADS's and their supporting resources at a single activity, an ADS and its associated resources that support a single function at one or more activities, or an aggregation of types of activity with a common function and/or mission.

Automated Data System (ADS). An assembly of procedures, processes, methods, routines, and techniques (including, but not limited to, computer programs) united by some form of regulated interaction to form an organized whole, specifically designed to make use of ADPE.

Automatic Data Processing Equipment (ADPE). Electronic data processing equipment and machines, irrespective of use, application, or source of funding.

Baud. Symbol rate, measured in symbols per second, used to describe speed of information transfer over communication lines.

Bit. The smallest part of a binary number. It is the symbol for binary and has two values. If the bit is "1" this is the set or active state. If the bit is "0" it indicates the reset or inactive state.

Byte. Represents a single character. It is the number of consecutive bits used to hold a character and consists of 8 adjacent binary bits.

Cathode Ray Tube (CRT). A visual display device that receives electrical impulses and translates them into a picture on a television-like screen. The CRT supplies what is often referred to as "soft-copy" output.

Central Design and Programming Activity (CDPA). An activity organized, staffed, and equipped to analyze, design, develop, program, test, implement, and maintain ADS as directed by the Commandant of the Marine Corps.

Central Processing Unit (CPU). Known as the heart of the computer system. It is composed of three units: (1) the control unit, which maintains order and controls activity within the CPU, (2) the arithmetic/logic unit, which performs arithmetic calculations and logical operations, and (3) the primary storage unit, which holds all instructions and data necessary for processing including intermediate and final results during manipulation of data.

Class I Systems. Those centrally managed Marine Corps standard ADS which are controlled by a functional manager at HQMC. These

systems are designed, programmed, and maintained by a CDPA. Modification by field ASC's or RASC's is not permitted.

Class IA Application. A Class I derivative which serves the data input function of a parent Class I system. Functional and technical responsibility are the same as a Class I but it is processed on minicomputers that are assigned to the supporting establishments and FMF.

Class IB Application. A Class I system in all respects except that it is processed locally on supporting establishment and FMF minicomputers.

Class II Systems. Those centrally managed Marine Corps ADS which are initiated and sponsored by the FMF or supporting establishments to meet recurring local management requirements. These systems are designed, programmed, and maintained by a CDPA after approval of the appropriate HQMC functional manager and the Director, C-4 Division. Modification by field ASC's or RASC's is not permitted.

Class III Systems. Those systems which are limited to those locally programmed data base inquiries or special reports which draw, by means of a data management system or application program, on existing magnetically readable data maintained by or for a Class I or II system.

Class IV Systems. Those locally designed and programmed applications which are processed on ADPE-FMF. They may extract, but not input or change, data from a Class I system. Locally produced data bases may also be used.

Compile. To translate a computer program expressed in a programming language into a computer-oriented language.

Data Base. A grouping of data elements structured to fit the information needs of all functions of an organization.

Data Retrieval. The locating and accessing of data for the purpose of data manipulation.

Debug. To detect, to trace, or to eliminate mistakes in computer programs or in other software.

Delegation of Procurement Authority (DPA). The authority granted from the General Services Administration (GSA) to another agency to authorize that agency to enter into a contract for the acquisition of computer devices.

Display Processing Unit. The IBM 4110 Central Processing Unit in its ruggedized configuration.

Documentation. Directives and publications which establish procedures for managing and operating a system.

Editing/Validation. Checks made by the operating system to (1) ensure all mandatory fields have been entered, (2) ensure data entered does not exceed or overlap the maximum field size, and (3) ensure that all numeric fields contain only numeric data.

Functional Managers. A HQMC staff agency whose mission includes the management responsibility for a specific functional area; i.e. manpower, intelligence, operations, logistics, aviation, or fiscal and the responsibility for developing and managing the ADS which support his area of responsibility.

Hardware. The electrical circuitry and physical devices that make up a computer system.

Information System. A system designed and used primarily for the purpose of assisting the Commandant of the Marine Corps and subordinate commanders in the acquisition and management of resources in the performance of assigned missions.

Initialize. To set counters, switches, addresses, or contents of storage to zero or other starting values at the beginning of, or at prescribed points in, the operation of a computer program.

Load. In programming, to enter data into storage or working registers.

Mainframe Computer. A term generally applied to computers which have a cost greater than $300,000.

Microcomputer. A term generally applied to computers which have a cost of less than $10,000. Micros are often a special-purpose or single-function computer on a single chip.

Minicomputer. A general term applied to computers which have a cost of from $10,000 to $300,000.

Modem. A device that modulates and demodulates signals transmitted over communications facilities.

Network. Any collection of nodes (devices) that can communicate with each other. In a network it is possible for users to send each other messages or files, but these capabilities are peripheral to the main thrust of work.

<u>Off-the-Shelf</u>. Referring to those devices which are commercially available from vendors without special manufacturing requirements or specifications.

<u>Operating System</u>. Those programs within a computer system that govern the control of equipment resources such as processors, storage devices, input/output devices, and files. The operating system programs resolve conflicts, attempt to optimize performance, and simplify the effective use of the system. They act as an interface between the user's programs and the hardware.

<u>Prompt</u>. A means of data input wherein the user is asked a specific question and is provided with a menu of possible responses, or wherein the user is otherwise guided by leads from the system.

<u>Query/Response</u>. The process of making a valid request to a computer system and receiving the information requested.

<u>Required Deliverable Items</u>. A listing of all items which are to be delivered to the purchaser in order to fulfill the contractual agreement. This includes hardware, software, and written materials.

<u>Required Operational Capability (ROC)</u>. A document which includes a statement of need and describes the threat or operational deficiency to be overcome, minimum essential performance bands, concept of employment, technical assessment, and initial broad-based estimates of required funds and personnel resources.

Response. See Query.

Software. The set of computer programs, procedures, and related documentation.

Source Data Automation (SDA). The use of special equipment to collect data at its source of occurrence.

Source Data Entry. The physical input process to SDA equipment.

Terminal. A device through which data can exit from or be entered into a computer.

Utility. A computer program designed to perform common functions, for example $DISKUT1 allocates and deletes files.

Validation. See Editing.

APPENDIX F

LIST OF APPLICABLE MARINE CORPS DIRECTIVES

MCO P1000.6D	ACTS MANUAL
MCO P1070.9B	RAMS/MAN
MCO P1070.12C	IRAM
MCO P1080.20H	JUMPS/MMS CODES MANUAL
MCO P1080.33B	ACUMAN
MCO P1080.35C	PRIM
MCO 3120.6A	MECHANIZED EMBARKATION DATA SYSTEM
MCO 3900.3D	MARINE CORPS RESEARCH, DEVELOPMENT, TEST AND EVALUATION
MCO 3900.4B	INSTRUCTIONS FOR PREPARATION OF RESEARCH AND DEVELOPMENT REQUIREMENTS DOC
MCO 3900.6B	MARINE CORPS (SPEED)
MCO 3900.11B	USMC RES, DEV, TEST AND EVAL WORK
MCO P3902.1	MARINE CORPS STUDIES SYSTEM (MCSS)
MCO P4400.20A	MARINE CORPS SUPMAN VOL II
MCO P4400.21B	MARINE CORPS SUPMAN VOL IV
MCO P4400.123B	FMF SASSY ACCOUNTING MANUAL VOL II
MCO P4400.124	FMF SASSY ACCOUNTING MANUAL VOL III
MCO P4400.125	FMF SASSY ACCOUNTING MANUAL VOL IV
MCO P4400.126D	FMF SASSY ACCOUNTING MANUAL VOL V
MCO P4790.1A	MIMMS INTRO MANUAL
MCO P4790.2A	MIMMS FIELD PROCEDURES MANUAL

MCO 4790.7	MIMMS AUTO INFO SYSTEM
MCO 5100.8E	MARINE CORPS GRD OCC & HEALTH PGM
MCO P5200.15A	AUTOMATED DATA SYSTEMS MANUAL (ADSM)
MCO 5200.17B	STANDARDIZATION OF MILITARY TERMS
MCO 5200.21	TRANSFER/STORAGE OF SENSITIVE COMPARTMENTED INFO (SCI) RECORDS
MCO 5210.11C	RECORDS MANAGEMENT PROGRAMS
MCO 5210.12D	MARINE CORPS TECHNICAL DATA REPOSITORIES
MCO P5211.2A	THE PRIVACY ACT OF 1974
MCO 5213.7B	MANAGEMENT OF BLANK FORMS
MCO 5214.2B	INFORMATION REQ IN THE MC
MCO 5230.2C	CENTRAL DESIGN AND PROG ACTIVITY
MCO 5230.4C	ADMIN INST FOR FILE MAINT IN JUMPS/MMS
MCO 5230.8	MAINT AND MODIFICATION OF ADP APPLICATIONS SOFTWARE; REQ FOR
MCO 5230.9	STANDARD PROCEDURES FOR THE CONTROL OF CENTRALLY MANAGED ADS
MCO P5230.10	ADPE-FMF INPLEMENTATION AND MANAGEMENT PLAN (I & MP)
MCO P5233.1	ADP MANAGEMENT STANDARDS MANUAL
MCO 5238.1	ASSIGNMENT AND STANDARDIZATION OF ADP SUB CLASS CODES
MCO P5320.5B	PERSONNEL REQ CRITERIA MANUAL
MCO P5510.14	MARCOR ADP SECURITY MANUAL
MCO 5521.3G	PERSONNEL SECURITY CLEARANCE AND ACCESS
MCO 5720.56	AVAILABILITY TO THE PUBLIC OF MARINE CORPS RECORDS
MCO P7100.8H	FIELD BUDGET GUIDANCE MANUAL

MCO P7220.31D	JUMPS FPM VOL I
MCO P7220.37	JUMPS FPM VOL II
MCO 10462.7A	THIRD PARTY COMPUTER MAINTENANCE

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Thesis
A2425 Aday
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